

Huang, Qingan (2014). The power of words - CEOs' psychological influences: exit, change & hold: the stories of leadership succession: three empirical studies on companies in the FTSE All-Share Index. (Unpublished Doctoral thesis, City University London)



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**Original citation:** Huang, Qingan (2014). The power of words - CEOs' psychological influences: exit, change & hold: the stories of leadership succession: three empirical studies on companies in the FTSE All-Share Index. (Unpublished Doctoral thesis, City University London)

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# **The power of words - CEOs' psychological influences**

Exit, change & hold: the stories of leadership succession

Three empirical studies on companies in the FTSE All-Share Index

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**A thesis presented in partial fulfillment of the requirements for  
the degree of Doctor of Philosophy**

June, 2014



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## ABSTRACTS

Leadership transition is a critical period for any organizations. By researching firms in the FTSE All-Share Index, this thesis offers three empirical studies to explore some interesting problems in this important epoch. The samples used for the research are those companies that changed their CEOs in a six-year (from 2002 to 2007) window. This study identified the importance of CEOs' psychological factors not only for the predecessors but also for the new leaders. The first study looks at the old CEOs before the CEO turnover; the second and third studies follow the new CEOs longitudinally after the succession.

The first essay investigates how old CEOs' psychological factors influence their types of departure, i.e. voluntary and involuntary CEO turnovers. This study integrates both cognitive and emotional factors, appreciating the proactive roles of CEOs in the leadership succession process. Apart from conventional reasons, e.g. firms' prior performance, old CEOs' power, their future focus attention (FFA) and negative emotion (NE) provide crucial explanations determining the turnover types. Empirically, this study identifies that the level of CEOs' FFA, signaling the planned career management behaviors, will increase the likelihood of voluntary CEO turnover. I also found that the level of CEOs' NE, reflecting the uncooperative behaviors, will increase the likelihood of involuntary CEO turnover.

The second essay studies how new CEOs' psychological factors influence the post succession strategic changes (PSSC) of firms. Using the trilogy of mind perspective, on top of cognition, I advocate that new CEOs' emotion and conation serve as the impetus for the PSSC. By tracing the identical new CEOs over years after their succession, the empirical results of this longitudinal study demonstrate that those intra-individual psychological (time-varying) factors of new CEOs are important for the PSSC. New CEOs' future focus attention (FFA), commitment to change (C2C) will significantly increase the PSSC and new CEOs' negative emotion (NE) will significantly reduce the PSSC.

Based on the cognitive continuum theory (CCT), the third research study advocates that new CEOs' cognitive reasoning provides new explanations for the mechanism behind the cash holding phenomenon. It is down to CEOs to appreciate the needs and the associated risks. I identify that the degree of analysis (DoA) in new CEOs' cognitive continuum will increase firms' cash holding level because DoA tends to raise the calculated transaction costs, the management controls, the uncertainty avoidance behaviors and the opportunity costs.

Using a psycholinguistic approach and computer-aided text analysis (CATA) technique, directly measuring CEOs' mind, we expect to explore the "black box" of CEOs' roles comprehensively in the leadership succession period.

**Key words:** CEO turnover, succession, cognition, emotion, conation, analysis, intuition, cognitive continuum, FFA, NE, C2C, CCT, DoA, PSSC, CATA

# Contents

- Chapter 1. Introduction to the research ..... - 1 -
  - 1.1. Research purpose & rationale ..... - 1 -
  - 1.2. Summary of research ..... - 3 -
    - 1.2.1. Why do predecessors (old CEOs) step down from different routes? ..... - 4 -
    - 1.2.2. Successors' mind and PSSC ..... - 5 -
    - 1.2.3. King and sting, new CEOs' cash holding strategies ..... - 6 -
  - 1.3. The structure of this thesis ..... - 8 -
- Chapter 2. A synthesis of the background knowledge and research settings ..... - 9 -
  - 2.1. CEO position in a corporate hierarchy & CEO succession ..... - 9 -
  - 2.2. Hard & soft, hot & cold, the importance of psychology in studying CEO succession .... - 11 -
    - 2.2.1. Hard & Soft ..... - 11 -
    - 2.2.2. Cold vs. Hot ..... - 12 -
  - 2.3. The research setting - the FTSE index and UK list firms ..... - 14 -
  - 2.4. The research philosophy, sample strategies and data collection procedure ..... - 15 -
  - 2.5. The raw data and the content analysis ..... - 18 -
    - 2.5.1. News articles in the media & retrieval ..... - 18 -
    - 2.5.2. CEOs' shareholder letters/statements ..... - 19 -
    - 2.5.3. Computer-aided content analysis (DICTION 5.0 & LIWC) ..... - 20 -
- Chapter 3. Essay One: CEOs' psychological factors and CEO turnover types ..... - 24 -
  - ABSTRACT: ..... - 24 -
  - 3.1. Introduction ..... - 25 -
  - 3.2. Literature review ..... - 26 -
  - 3.3. Hypotheses development ..... - 30 -
    - 3.3.1. Old CEOs' future focused attention & its influences ..... - 31 -
    - 3.3.2. Old CEOs' negative emotion (NE) & its influences ..... - 37 -
  - 3.4. Methods ..... - 41 -
    - 3.4.1. Constructs and Measurements ..... - 42 -
    - 3.4.2. Dependent variable- CEO turnover types ..... - 43 -
    - 3.4.3. Independent and control variables ..... - 44 -
  - 3.5. Data analysis ..... - 45 -
  - 3.6. Discussions and Conclusions ..... - 50 -

Chapter 4. Essay Two: The impacts of new CEOs’ psychological factors on post-succession strategic change .....	- 53 -
ABSTRACT:.....	- 53 -
4.1. Introduction: .....	- 54 -
4.2. Literature review.....	- 56 -
4.3. Hypotheses development .....	- 58 -
4.3.1. Cognition .....	- 58 -
4.3.2. Emotion .....	- 60 -
4.3.3. Conation/Intention .....	- 62 -
4.4. Methods.....	- 64 -
4.4.1. Research design.....	- 64 -
4.4.2. Key constructs and variable measurements .....	- 66 -
4.5. Data analysis .....	- 72 -
4.6. Discussions & conclusions .....	- 81 -
4.6.1. Theoretical implications .....	- 81 -
4.6.2. Methodological implications .....	- 81 -
4.6.3. Limitations of this study and future work.....	- 82 -
Chapter 5. Essay Three: The degree of analysis (DoA) of new CEOs’ cognitive reasoning and firms’ cash holding .....	- 84 -
ABSTRACT:.....	- 84 -
5.2. Theoretical Background: the cash holding motives.....	- 86 -
5.2.1. Transaction motives.....	- 86 -
5.2.2. Precautionary motives .....	- 87 -
5.2.3. Agency motives.....	- 87 -
5.3. Hypothesis development .....	- 88 -
5.3.1. CEOs and their cognition for firms’ financial decisions and cash holding policies ...	- 88 -
5.3.2. Reasoning.....	- 89 -
5.3.3. Dichotomy vs. continuum. ....	- 91 -
5.3.4. Hypothesized relationships: Cognitive reasoning in financial decisions.....	- 92 -
5.4. Research methods and measurements.....	- 97 -
5.4.1. Dependent variable .....	99
5.4.2. Control variables .....	99

5.4.3. Explanatory variable ..... 102

5.5. Data analysis ..... 104

5.5.1. Analytical procedures ..... 104

5.5.2. Descriptive analysis (statistical description and univariate comparisons) ..... 106

5.5.3. Multivariate analysis ..... - 110 -

5.6. Discussions and conclusions ..... - 116 -

Chapter 6: Concluding remarks and reflections ..... - 119 -

6.1. Main findings and comparisons ..... - 120 -

6.2. Novelties and contributions ..... - 122 -

6.2.1. Novelties..... - 122 -

6.2.2. Contributions ..... - 123 -

6.3. Limitations and future studies ..... - 123 -

6.4. Practical implications and reflections..... - 125 -

6.4.1. Practical implications..... - 125 -

6.4.2. Some reflections ..... - 127 -

REFERENCES: ..... - 129 -

APPENDICES ..... - 145 -

LIST OF TABLES, FIGURES & APPENDICES

Table 3.1: Summary of constructs, variables, measurements and sources..... - 42 -

Table 3.2: Data description and correlation ..... - 46 -

Table 3.3: Logit model of CEO turnover types ..... - 47 -

Table 3.4: The classification accuracy of the logit regression model ..... - 50 -

Table 4.5: Summary of Measures and Sources ..... - 65 -

Table 4.6: Description and correlation matrix for key variables ..... - 74 -

Table 4.7: Fixed effects models of PSSC..... - 76 -

Table 5.8: Summary of Constructs, Variables, Measurements Theoretical Assumptions and Data Sources..... - 98 -

Table 5.9: Statistical description and correlation ..... 107

Table 5.10: Characteristics of firms and new CEOs’ DoA by cash holding level quartiles ..... - 109 -

Table 5.11: Firms’ cash holding level under different estimations and models ..... - 111 -

Figure 1.1: An overview of three empirical studies ..... - 3 -

Figure 6.2: A reflection on three empirical studies ..... - 120 -

Appendix 1: The FTSE index family tree..... - 145 -

Appendix 2: The properties of intuitive and analytic cognition ..... - 146 -

Appendix 3: The importance of lagged dependent variable ..... - 147 -

## **ACKNOWLEDGEMENTS**

“I have to admit that I have learned a lot from this six-year US style PhD process. In this project, I have constructed an informative database which contains some interesting stories and has some publishable potential. So far, three empirical papers have been peer-reviewed and accepted by important international academic conferences.

I would like to wholeheartedly show my appreciation of my supervisors Professor Vangelis Souitaris and Dr. Hans Frankort. They have offered me invaluable advice and support throughout these years.

I would also like to thank my co-supervisor - Professor Vincent-Wayne Mitchell, my chair of the PhD transfer panel - Professor Igor Filatotchev, my training instructors, e.g. Professor Charles Baden-Fuller, Professor Joseph Lampel and Professor George Balabanis in my first two years at Cass. I am indebted to all the faculty members, staff, PhD officers and other PhD colleagues at Cass and other institutes who have given me support, encouragement and criticism.

Above all, I want to thank my family and friends for their enormous help and support in so many ways.”



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## **Chapter 1. Introduction to the research**

### **1.1. Research purpose & rationale**

The history of top executive studies can be tracked back to the early years of the 20th century (Barnard, 1938). Even in the embryo of strategic management research, scholars had already started to know that “strategy is a human construction” ((Andrews, 1971), p.107), particularly as a human construction of managers. The popularity of research on top executives is self-evident. It is an eye catching domain and generates much interest for external people such as stakeholders, investors, the media and the general public. Top executives can greatly influence what happens to organizations and to themselves, whether good or bad (Finkelstein et al., 2009), for example, Jack Welch at GE, Jürgen Schrempp at Daimler-Benz and so on. Under ambiguity, uncertainty and complexity, individuals inject a great deal of themselves into their decisions (Barsade, 2002, Amabile et al., 2005, Baron, 2008). Therefore, apart from objective contextual factors such as environments, competition and company resources, those subjective human factors, for instance, the biases and dispositions of top managers do matter under uncertainty. Their personalities, experiences, values, social connections, fatigue and envy will have impacts on the decisions and organizational outcomes.

This thesis looks at chief executive officer (CEO) succession as the vital event in studying top executives. Leadership transition evokes hope, fear, and anxiety for organizations and stakeholders (Finkelstein et al., 2009, Kesner and Sebor, 1994, Rowe and Cannella, 2005, Giambatista et al., 2005). This thesis investigates the antecedents of CEO departure types and the stories after. It attempts to address two main general questions (“why?” and “so what?”); more specifically, why old CEO (incumbents)

psychological factors lead to different types of turnover and what the post succession implications are caused by new CEO (successors) psychological factors.

Inseparable from strategic management studies, CEO succession research is rooted in objective, rational and economic approaches. The title of CEO gives a manager the ultimate legal authority, power, and responsibility in the corporate hierarchy (Zhang and Rajagopalan, 2003). From a “variable human” perspective (Finkelstein et al., 2009), the roles of “soft”, subjective human differences should be taken in to account, for instance, biases, egos, aptitudes, experiences and others. Psychological factors, i.e. the thoughts, feelings, attitudes, or other cognitive or affective characteristics of an individual will influence his/her behavior. They are the fundamental differences representing human mental functions and behaviors. Similar to the status of research in psychology, current strategic management literature ignores the “hot” elements of people such as emotion and intentions. From a different zoom lens, we are able to explore the effects of these ignored psychological factors in the models of the CEO succession studies.

“Words allow people to convey and interpret meaning, hence potentially to influence perceptions, emotions, attitudes, decisions and associated behaviour”(Shapiro, 2014). The topic of this thesis is “the power of words” which is also the theme of the 74th Academy of Management (AoM) Annual Meeting 2014. Language is a system of visual and/or vocal symbols which contain meaning to the user and to the recipient(Harley, 2013). Psycholinguistics is to study verbal behaviour investigate the role of human psychology in language acquisition and comprehension (Carlson et al., 2009). Using the psycholinguistic content analysis approach, this research study extracts CEO psychological factors and helps to explore the knowledge of how top executives can leverage the power in words to bring some positive changes to both the organizations and themselves.

## 1.2. Summary of research

This thesis contains three independent essays reported in Chapter 3, 4 and 5. The main focus is the importance of CEOs’ psychological factors for their decisions and the firms’ strategies. The first essay will apply a traditional functional localization view of brain into the research of old CEOs’ turnover (Pessoa, 2008). The second essay will extend the trilogy of psychology theory (Hilgard, 1980) to investigate post succession strategic change. The third essay will take a cognitive continuum theory (Dhami and Thomson, 2013) to study CEOs’ cash holding behavior .Essay one and Essay two have been peer-reviewed and accepted by the 74<sup>th</sup> AoM annual meeting 2014; Essay three also has been peer-reviewed and accepted by the 34th Strategic Management Society (SMS) Annual International Conference 2014. Figure 1.1 outlines the rationale and main points of these three empirical studies.

Figure 1.1: An overview of three empirical studies

	Essay 1: Voluntary and involuntary CEO turnovers	Essay 2: New CEOs’ minds and post succession strategic change (PSSC)	Essay 3: New CEOs & cash holding policies
<i>Theoretical gaps &amp; motivations</i>	Ignored proactive roles of old CEOs; career management perspectives; neglected emotional components in the judgment systems	New CEOs’ non-cognition psychological factors are ignored; the intra-individual (time-varying) differences are neglected.	Attempts to open the “black box” of CEOs’ bounded rationality decisions of cash holding
<i>Organizational phenomena/ assumptions</i>	Old CEOs’ psychological factors are supposed as additional antecedences of the CEO turnover type.	Apart from external causes, successors’ psychological factors are assumed as the internal causes of PSSC.	Firms holding different levels of cash is due to the degree of analysis (DoA) of new CEOs’ cognitive reasoning.
<i>Object of study</i>	Predecessors (old CEOs )	Successors (new CEOs)	Successors (new CEOs)
<i>Focal constructs</i>	Old CEOs’ Future Focused Attention (FFA); negative emotion (NE)	New CEOs’ FFA, NE and commitment to change (C2C)	The DoA in new CEOs’ cognitive continuum
<i>Methods</i>	Psycholinguistic content analysis, logit regressions	Psycholinguistic content analysis, exponential smoothing, fixed effects modelling.	Content analysis, quartile comparisons, system Generalized Method Of Moments (GMM) dynamic modelling
<i>Expected outcomes</i>	Both FFA and NE will influence the CEO succession type.	Internal factors, such as FFA, NE and C2C will influence the magnitude of PSSC.	DoA provides new insights about the trade-off in cash holding level

### 1.2.1. Why do predecessors (old CEOs) step down from different routes?

The first essay, entitled *CEOs' psychological factors and CEO turnover types*, is motivated by three reasons in studying types of CEO turnover. Current literature treats old CEOs as passive players in the process of leadership transition. The first motivation is to refocus on old CEOs' initiatives because whether a succession is involuntary or voluntary depends on their own will. I argue that on top of those conventional factors, i.e. firms' prior performance and old CEOs' power, their psychological factors may have some extra impact on the types of succession. The second reason for this study is to incorporate a career management perspective into the CEO transition process. The third motivation comes from the deficiency in research of top executives' emotions as an ignored factor in the fields of strategic management and psychology.

Much existing empirical literature has a problem of correctly categorizing two different types of CEO turnover (Hilger et al., 2012, Giambatista et al., 2005). To investigate this phenomenon, this study uses some appropriate methods to classify the difference. The study object is the predecessors, in other words, the old CEOs of the companies. Psychological factors here are those distinctive cognitive and emotional elements of CEOs' mind. The focal constructs (independent variables) are old CEOs' FFA and NE. These explanatory variables were generated from predefined psycholinguistic content analysis software, Linguistic Inquiry and Word Count (LIWC). The logit regression method was adopted to explain the dichotomous dependent variable of CEO turnover type, i.e. involuntary versus voluntary departures.

Empirical results illustrate that CEO turnover types are not only influenced by external factors, but also internally by old CEOs' psychological factors. The likelihood of voluntary turnover is positively related to the old CEOs' FFA because future focused

CEOs are better in managing their future career prosperity and arranging succession planning for their companies. On the other hand, the research found that the level of old CEOs' NE increases the likelihood of CEO involuntary turnover because it represents the uncooperative behaviors between old CEOs and the board of directors (BoDs).

#### 1.2.2. Successors' mind and PSSC

The second essay, entitled *The impacts of new CEOs' psychological factors on post-succession strategic change*, is to address two gaps in the PSSC literature. First, similar to the discussion above on essay one, existing literature in PSSC studies has ignored those non-cognition factors, i.e. emotion and intention of managers' minds; this study will incorporate these neglected factors to provide a better explanation for PSSC. Second, this research is not to compare the strategic differences between pre and post succession; rather, this study looks at the influences of intra-individual (time-varying) differences of new CEOs' psychology on strategic change in a longitudinal setting.

In the second essay, the object of study is the successors (the new CEOs). Explanatory variables, i.e. new CEOs' FFA, NE C2C, were extracted from computer-aided text analysis (CATA). This essay looks at the variation of PSSC and applies exponent smoothing methods to gauge the changes from different angles. Focusing on those internal causes, this longitudinal study investigates the intra-individual (time-varying) differences of new CEOs' psychology rather than the differences in the psychology between predecessors and successors. The empirical observations on the trilogy of CEOs' psychology (i.e. cognition, emotion and conation (Hilgard, 1980, Piderit, 2000)) provide strong evidence on the positive effects of FFA, C2C and negative effects of NE on the variation of PSSC, both in each effect individually and in the integrated

effects simultaneously. This study illustrates that including these neglected elements of CEOs' psychology, the explanatory power will be enhanced dramatically.

### 1.2.3. King and sting, new CEOs' cash holding strategies

The title of the third paper is *The degree of analysis (DoA) of new CEOs' cognitive reasoning and firms' cash holding*. Leadership transition is a risky process (Giambatista et al., 2005), (Rowe and Cannella, 2005). The motivation of the third essay is to open the "black box" of successors' bounded rationality decisions in cash holding, as one of the most important issues for the new leaders in this risky period.

Current research in cash holding is mainly based on the economic rationales. A small number of studies have begun to be aware of the importance in leadership (Orens and Reheul, 2013); those CEO demographic characteristics are proxies. However, I believe that cash holding is a dynamic partial adjustment process so that these static characteristic proxies have little explanatory power in this context. This research proposes that firms' cash holding level depends on how new CEOs use different DoA in their cognitive continuum to understand and interpret the needs and risks of holding cash, whereas the majority of researchers in behavior finance have been preoccupied by the high DoA in cognition and its advantages. This study suggests that taking account of the DoA, in particular intuition, i.e. cognition with a low DoA, will add stronger explanatory power for their cash holding policies.

The object of this study is the new CEOs; the focal construct (independent variable) is the DoA as the measure of CEOs' cognitive reasoning which lies on the continuum between analysis and intuition (Hammond, 1996). This study adopted the CATA approach to measure DoA and used the system GMM dynamic modelling to address the nature of a

partial adjustment process. These direct measurements increase our understanding of the psychological mechanism behind cash holding decisions.

This study discovers that a primarily analytic DoA may increase the estimated transactional costs of raising funds, diminish fast-moving competitive advantages, and increase the related opportunity costs. It makes the CEOs more precautionary and more risk adverse. Consequently, it raises the cash holding levels. Empirically, results provide strong evidence about the effects of DoA on the cash holding level under different scenarios.

To sum up, these three independent studies presented in this thesis test, deepen and expand our understanding of the effects of CEOs' psychological factors on their decisions and organizational behaviors. Modestly, the contributions of these studies mainly embody in explanation rather prediction.



### 1.3. The structure of this thesis

There are six chapters in the thesis:

- 1) The introductory chapter offers an outline of the thesis. It summarizes the motivations, methods and main points from three empirical studies.
- 2) The second chapter provides a general review of the background knowledge and the research setting. It discusses the roles of CEOs in a corporate hierarchy; the “hard & soft”, “hot & cold” aspects in strategic management studies from different angles. It justifies the appropriateness of our research philosophy, sampling strategy and content analysis methodology.
- 3) The third chapter is an essay exploring the relationships between old CEOs’ psychological factors and different CEO turnover types. It will develop a model which takes into consideration of the initiatives of old CEOs’ proactive roles.
- 4) Chapter Four is the second essay, examining the effects of successors’ psychological states from the trilogy of mind on the PSSC.
- 5) Chapter Five, the third essay, investigates the psychological mechanism of new CEOs behind the cash holding decision. It examines how new CEOs’ cognitive approach serves as an alternative trade-off explanation complementing current economic rational reasoning.
- 6) The final chapter synthesizes the findings from three empirical research studies. It discusses the contributions and the practical implications of this thesis. It debates the limitations of these studies and future research potential of this thesis. It also reflects on the importance of CEOs’ psychological factors in the leadership succession epoch and in other arenas.

## **Chapter 2. A synthesis of the background knowledge and research settings**

This chapter synthesizes the general information and background knowledge of this thesis. It argues the importance of CEOs in strategic management, particularly the importance of CEOs' psychology in the leadership transition process. It briefly introduces the research settings and the nature of the Financial Times and London Stock Exchange (FTSE) index companies. This chapter illustrates the research philosophy, sampling strategies and the data collection procedures adopted by this thesis. It intends to lay a solid foundation for the following essay chapters. Details about the raw data, analysis approaches and the processing techniques will be also discussed here to justify their appropriateness.

### **2.1. CEO position in a corporate hierarchy & CEO succession**

A CEO is the highest ranking manager in charge of the total management of a company. He/she normally needs to report to the BoDs, a body of elected and appointed members who jointly oversee the activities and performance of an organization. For a listed company, members of the BoDs are normally elected by stockholders. The chairman is the head of the board. A BoDs is a governance mechanism that regulates but is not directly involved in the actual management of the firm. It plays a key role in selecting appropriate executives, setting up executive compensation schemes and monitoring their performance. BoDs define the general policies representing the shareholders' values and rights. A top management team (TMT) is a team of senior executives who collectively formulate, articulate and execute the strategic and tactical moves of the organization. An organization is the reflection of their TMT (Hambrick and Mason, 1984). However, I

believe that CEOs are the most important key decision-makers among those people mentioned above that can be set as the unit of analysis. Members of the TMT, often even members of BoDs, are recommended or selected by the CEOs. Strategically, CEOs identify the goals and purposes and make strategic choices for the companies (Child, 1972); operationally, CEOs are responsible for the effectiveness and efficiency of their firm's day to day management.

To change a CEO is a critical decision for any company. CEO succession is an important, unique and very visible event (Kesner and Sebor, 1994) that often has profound impacts on the organization, for example, igniting other TMT members change and leading to strategic reorientation (Zhang and Rajagopalan, 2003). Although I acknowledge the importance of the TMT (Kesner and Dalton, 1994), a CEO is the agent ultimately responsible and accountable for actions on and reactions to the firm's strategy, design and performance. The CEO title gives an individual the ultimate legal authority, power and responsibility in the corporate hierarchy (Datta et al., 2003). In a leadership transition context, the incumbent (old CEO) is replaced by the successor (new CEO). This process is the most pervasive management change. Internally, more or less, every member in the organization will experience some effect during this period; externally, those such as suppliers, customers, competitors, societies and governments will observe the succession events and the characteristics of new CEOs to foretell the firms' future destiny.

## 2.2. Hard & soft, hot & cold, the importance of psychology in studying CEO succession

### 2.2.1. Hard & Soft

Dominant theories in strategic management such as the resource based view, transaction cost theory are “hard” theories which are deeply rooted in economic and rational foundations. Other sociological theorists look at human interactions and take into consideration the learning and dynamic capabilities in organizations. More and more, the importance of decision-makers have been discussed in theories such as upper echelon theory (UET) (Hambrick, 2007) and attention based view (ABV) (Ocasio, 2011).

According to the American Psychological Association (APA), psychology is the study of human’s mental functions and behaviors. In the past two decades, scholars attempt to incorporate the insights of human psychology as the “soft” elements to refine the understanding of strategic issues such as the evolution of competitive industrial structures (Peteraf and Shanley, 1997, Porac et al., 1995), the nature and sources of bias for investment decision (Schwenk, 1984).

CEO succession has drawn much attention from the field of management studies. Scholars have conducted research to investigate the antecedents of CEO succession in which dependent variables are those of rate, probability and the likelihood of succession event; the consequences of CEO succession such as performance, compensation, strategies and reconstructing outcomes and so on are normally set as dependent variables (Giambatista et al., 2005, Hutzschenreuter et al., 2012, Colbert et al., 2008). The importance of psychology in strategic leadership has appeared in the literature (Hodgkinson and Healey, 2011, Powell et al., 2011, Weber and Johnson, 2009, Sarasvathy, 2003). The ways CEOs manage their companies are influenced by their thoughts and

feelings (Hodgkinson and Healey, 2011, Rowe and Cannella, 2005). Therefore, in this thesis, I propose that incorporating CEOs' psychological factors will help us understand their influences in the leadership transition processes better. Taking into account these subjective (soft) factors of CEOs together with objective (hard) reasons, i.e. the economic rationale, we can improve our knowledge about firms' activities in this transition period.

### 2.2.2. Cold vs. Hot

Researchers tend to classify psychological factors into two categories: cognition and emotion (Szabla, 2007, Schwarz, 2000). Cognition and emotion are two fundamental components of human psychological activities to drive motivation systems, to mobilize resources, to enhance perceptual processing and to prepare for action (Bradley, 2008). Cognition refers to an information processing view of psychological functions. Emotion is the subjective, conscious experience (positive or negative) associated with a particular pattern of physiological activity (Forgas, 1995, Forgas and George, 2001).

Cognition has been seen as rational, dispassionate and "cold", and emotion has been considered as irrational, passionate and "hot". In studying organizations, cognition and emotion are two crucial elements for people's attitudes to deal with dynamic challenges (Piderit, 2000). Although cognition is very important in psychology, particularly in representations and computations (Stubbart, 1989), it is not the only component of the human mind. Based on the information processing logic such as mathematic calculations and inference, cognitive psychology is too "cold" (Abelson and Clarke, 1963, Redlawsk, 2002). The wish is the father to the thought and we are slaves of our emotions (Damasio, 1994). Emotion will be either advancing (positive emotion) or hindering (negative emotion) an organism's explicit or implicit goals (Fischer et al., 1990).

Cognition is a highly dominant topic in strategic management studies (Kaplan, 2011); (Walsh, 1995). Emotion had been ignored by much literature but it is becoming of more and more concern (SEO and Barrett, 2007, Liu and Maitlis, 2012, Rajah et al., 2011). Thoughts and decisions are influenced by the affect and conation of the key decision-makers. If we overemphasize a time primarily on cognition or emotion, the total experiences are subordinated, and the psychological reality is incomplete. Thus, I propose that if we can integrate more psychological elements together, we will have a better picture of the mechanism explaining many phenomena in strategic management. Therefore, for this thesis, I attempt to incorporate cognition, emotion and others to shed more light on the influences of CEOs on the leadership transition process. The reasons for me to select FFA from cognition and NE from emotion as two focal constructs are: 1) Because the future is unknown, future focus is to consider the most abstract time period (Shipp et al., 2009), Therefore, FFA may strongly relate to need for cognition (Cacioppo and Petty, 1982), which makes it a relevant and interesting construct the context of CEO succession study. 2) Due to individuals will give high priority to consistency which in turn fosters the basic orientation that bad is stronger than good. According to Baumeister et al.(2001)'s literature review, negative emotion has much stronger power over the positive one and has more impacts on individual's decision and behaviors.

Furthermore, according to the Cognitive Continuum Theory (CCT) (Doherty and Kurz, 1996, Hammond, 1996), modes of cognition lie between the analysis and intuition continuum which depend on different degrees of analysis. Traditionally, strategic and financial decisions are dominated by a high DoA of cognitive reasoning. Managers are preoccupied by “hard” data (quantitative) which can be represented and calculated by complex computational models of risk, capital and credit (Kupiec, 2002). However, more

and more researchers have identified the important role of intuition, i.e. low DoA cognition. For example, some credit decision interview studies (Lipshitz and Shulimovitz, 2007) found when rating the credibility of loan applicants, loan officers integrate “hard” financial data with “soft” data from impressions and ‘gut feelings’; they regarded feelings as more valid indicators of the applicants’ credit worthiness than financial data (they are more used to impression information and give more credit to impression information). They even claim that relying on intuition may lead to better evaluation results and gain more creditworthiness than deliberation decisions. This thesis will explore the relationships between DoA in CEOs’ cognition reasoning and firms’ cash holding policies.

However, applying more direct and closer measures seems to be unrealistic in the CEO population. CEOs are generally not willing or not available for interviews and are less likely to complete questionnaire by themselves (Bednar and Westphal, 2006). Using a proxy will face the challenges of validity and reliability issues. Measurement is one of the biggest obstructions hampering our progress in unveiling the “black box” of a manager’s mind and decisions. Hence, this thesis attempts to adopt some novel approaches of psycholinguistic and content analysis to deal with these problems.

### **2.3. The research setting - the FTSE index and UK list firms**

Existing CEO succession studies are mainly in the context of the United States of America (USA) because data can be more easily obtained by American researchers using sophisticated US emphasized data-sources such as COMPUSTAT, Dun & Bradstreet Database and Lexis and so on. I want to expand the research scope by looking at firms listed in the FTSE because I want to make some contextual contributions. There is a deficiency in CEO succession studies in the United Kingdom (UK). More than 2500 companies currently trade on the London Stock Exchange, in which the top 600

companies with the highest market value comprise the FTSE All-Share Index.<sup>1</sup> They were worth nearly £1.8 trillion in 2011 and represent 98% of the full capital value of all the UK listed firms.<sup>2</sup> FTSE All-Share companies also account for 10% the world's equity market value.

The constituents in the FTSE indices are reviewed regularly according to some transparent public set of rules by an independent committee. The FTSE publishes the notes of change annually from which we can identify those firms which have dropped out, i.e. a) some companies downgraded to the FTSE All-Small Index and b) some ceased trading due to being bankrupt or delisted for various reasons.

## **2.4. The research philosophy, sample strategies and data collection procedure**

Philosophy is informing the process of social investigation and the way one thinks about the development of knowledge implicitly or explicitly (Denscombe, 2007). It also enhances the researchers' confidence about the appropriateness of their methodology to the research problems and then to the research results (Bryman and Bell, 2003). The purpose of this research is to understand the importance of CEOs' psychology in the leadership transition period, i.e. a) the relationships between old CEOs' psychological factors and turnover types; b) the impacts of new CEOs' psychological factors on the organizational consequences. The research philosophy underlying the current study is that of positivism, which is usually (but not exclusively) associated with quantitative methods of research aimed at establishing general laws describing human behavior from which

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<sup>1</sup> More than 35% of FTSE All-Share Index companies operate in the financial sectors.

<sup>2</sup> For more detail on the FTSE index family, please refer to Appendix 1: the FTSE index family tree.



predictions can be made. It adopts hypothesis testing (research commences with questionable theories) and focuses on the individual CEO as the unit of analysis.

To overcome the survival bias over the years, an approach suggested by Page and Abdullah (2009) is adopted to cover those downgraded, delisted and dead firms. In our study, the chosen companies are those memberships of the FTSE All-Share Index between two points of time: 3<sup>rd</sup> January 2002 to 3<sup>rd</sup> May 2011. A reverse selection strategy is adopted and first, I look at the FTSE All-Share constituents, 622 companies on 3<sup>rd</sup> May 2011 and then add up all the dropped out firms according to the FTSE All-Share change notes from 3<sup>rd</sup> January 2002 to 3<sup>rd</sup> May 2011. The firms disappeared from the FTSE totaled 351 and 183 companies were downgraded to the FTSE All-Small Index during this timeframe. I then use the MS Excel filter function to retain the unique value of the company names because there are some overlaps among these three. At this stage, I retrieved 1146 companies for the population of our study.

Tracing these 1146 companies, I continued to retain companies for further investigation under the criteria below:

- 1) Selected firms should have CEO succession events from 2002 to the end of 2007 (if there are two or more changes in the same firm, I only record the latest one).<sup>3</sup>
- 2) Selected firms should not operate in the financial industry.<sup>4</sup>
- 3) Selected firms should have CEOs and Board of Directors' profiles, compensation and demographic information available in our data sources.
- 4) Selected firms should have CEOs' shareholder letters/statements available in their annual reports from our data sources.<sup>5</sup>

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<sup>3</sup> We use the Boardex analysis function and Bloomberg Mgmt function to identify the CEO successions; crosschecking in two databases can calm down some validity and reliability concerns, particularly the missing data issues.

<sup>4</sup> Prior research reports that firms in the financial industry will behave differently (Page & Abdullah 2009)

I collected data from seven places: 1) Bloomberg terminal<sup>6</sup>; 2) Boardex<sup>7</sup>; 3) Reuters' Thomson One Banker<sup>8</sup> [T1B]; 4) Dow Jones Factiva<sup>9</sup>; 5) Nexis UK<sup>10</sup>; 6) the investor relationship section in the companies' corporate websites; 7) the Internet Archive.<sup>11</sup> I maximized observations by acquiring information from the Internet Archives (some old annual reports cannot be retrieved from Bloomberg or T1B; some dead companies' websites are no longer available). By crosschecking data in multiple sources, we eliminate the missing data problems and increase the number of firms qualifying for our study.

I hired 6 university student assistants to type in the content of the CEO letters/statements for those low resolution annual report documents which cannot be recognized by the Optical Character Reader (OCR) software. These assistants helped me to download company news from Nexis UK and Factiva and also code the raw data retrieved from Boardex. I also employed a Structured Query Language (SQL) expert to develop and manage a database in which information from different sources can be integrated.

After the above processes, I retained 148 companies from the FTSE All-Share Index in May 2011 and 71 companies from the dropped out records. Within these 219

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<sup>5</sup> Not all firms have the CEO position, for example, 4imprint group plc.

<sup>6</sup> The Bloomberg terminal is a computer system providing data services that include real-time, historical and descriptive data, analytics and news on a number of markets and securities globally.

<sup>7</sup> Boardex ([www.boardex.com](http://www.boardex.com)) is a database specialized for analyzing the profile and relationship of organization leaders in Europe and North America. It captures extensive personal information about 380,000 leaders (all directors in UK publicly traded firms are covered), including date of birth, nationality, education background, working experiences, board and non-board positions, and compensation.

<sup>8</sup> Thomson ONE Banker is a research tool that provides a full range of financial data and authoritative source documents.

<sup>9</sup> Factiva is a database providing current and retrospective news stories, periodical articles, and financial data from thousands of sources worldwide, covering virtually every subject category.

<sup>10</sup> Nexis UK is a news and business resource with more UK regional coverage in biographical, company, regulatory and legal information.

<sup>11</sup> The Internet Archive ([www.archive.org](http://www.archive.org)) offers permanent storage of and free public access to collections of digitized materials, including websites.

companies, I decided to take out firms operating in the Industry Classification Benchmark (ICB) utility industry because the government background of these firms and their corporate governance are strongly influenced by regulatory factors (Cleary, 2002, Dittmar and Mahrt-Smith, 2007).

After scanning through the available financial information, I also removed some outliers/strange firms, for example, those firms with negative sales figures or abnormal financial performance [return on sales (ROS), return on assets (ROA) and return on equity(ROE)]. I eventually retained 198 CEO succession cases in our sample which took place from 2002 to the end of 2007. These 198 firms are finally distilled into our dataset.

## **2.5. The raw data and the content analysis**

### **2.5.1. News articles in the media & retrieval**

Company news or company stories are important raw data sources for management researchers. They can provide new information about a firm's strategies to the market (Uotila et al., 2009), draw attention to a company (Barber and Odean, 2008) and reflect public perceptions of a company's actions as a watchdog (Bednar, 2012, Zavyalova et al., 2012).

For this thesis, company news is obtained from Factiva for each fiscal year (sources include Dow Jones Newswires, Reuters Newswires and major news and business publications such as Bloomberg and the *Financial Times* and so forth). A comparison of Factiva to Nexis UK and other databases demonstrates that Factiva is more complete with better coverage (for licenses and copyright reasons). Factiva is selected because of its generality, specificity and international focus. I only included articles containing the names of a company (including abbreviations in various versions, for example, the ticker

name) in the headline. Factiva's intelligent indexing tags help us to screen out irrelevant documents when the name or abbreviation of a company causes ambiguity. I also filtered out those duplicate articles in the news by using the Factiva "de-duplication" option. We also selected the "corporate/industrial news" option to reduce less relevant news further. Eventually, I gathered 428 megabytes of plain-text data in total, averaging 112.5 articles, 39323 words for each firm per year. For the scope of this thesis, the company news data had been mainly used to identify CEO turnover types explicitly<sup>12</sup>.

#### 2.5.2. CEOs' shareholder letters/statements

CEOs' letters to shareholders are commonly available documents in annual reports. They reflect the cognition of CEOs (Fiol, 1995). Unlike other financial statements, CEOs' letters to shareholders contain not only historical information, but also future forecasts (Geppert and Lawrence, 2008) which will be of interest to the public and shareholders to explore the mind of the CEOs. A CEO's words are powerful storytelling tools, fashioning opinions and offering important points of view (Amernic and Craig, 2007). Narrative information has been demonstrated to have power of explanation (Tennyson et al., 1990) in annual reports, and CEOs' letters to shareholders are platforms for preaching management's philosophies. CEOs' letters to shareholders are important instances of the use of language in the discourse of managers, providing valuable information such as the motives, attitudes and mental models of the CEOs (Amernic et al., 2010).

Although some might argue that companies sometimes use public relationship experts to decorate the content of these letters, researchers (Salancik and Meindl, 1984) have still found consistent CEO influences in these letters. CEOs project a "tone" for their

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<sup>12</sup> For more details about how I used the data, please refer to the section 3.4.2. Dependent variable- CEO turnover types.

companies and the narrative elements of CEOs' shareholder letters have a huge influence on the firms' strategy (Geppert and Lawrence, 2008). The thinking and feeling issues of CEOs' shareholder letters are primarily determined by CEOs because they have to endorse them. As a signatory, the CEO assumes legal responsibility for its content (Schoenberger, 2001). No matter whether the letters are entirely crafted by the CEOs or not, they are indications of the CEOs' mind-sets. CEOs have strong incentives to scrutinize and approve the final version before signature. The letters disclose the focus and emphasis of the CEOs. Annual CEO letters attempt to engage people's emotions and commitment to define their reality and to secure their compliance. CEOs' shareholder letters are one of the most obvious and understudied framing devices which researchers can access. They are important raw data sources for this research study.

#### 2.5.3. Computer-aided content analysis (DICTION 5.0 & LIWC)

Content analysis (CA) is a technique making inference by objectively and systematically identifying the specified characteristics of a message (Holsti, 1969) which include various formats, not only text, but also pictures, videotapes, as well as other visual or verbal data (Stemler, 2001). Roughly, CA is a structured process used to find patterns that occur in any form of communication (Geppert and Lawrence, 2008). These data must be durable in nature. CA is preferred, while other methods are too costly, no longer possible, or too obtrusive by using other techniques (Krippendorff, 1980). The CA of texts offers a number of potential benefits; it can be used to identify differences among communicators (Weber, 1990) and avoid recall biases (Barr et al., 1992). It is also useful for examining trends and patterns in documents (Stemler, 2001).

The CA of written documents is useful for reconstructing the perceptions and beliefs of their authors (D'Aveni and MacMillan, 1990). The basic assumption for CA is

that authors' mental models can be detected through the presence of, absence of, and frequency with which certain concepts are used in texts (Carley, 1997).

Generally speaking, there are three kinds of CA methodology (Morris, 1994), (Short and Palmer, 2008), i.e. human scored schema, individual word count systems and artificial intelligent computerized systems. The first method will define units of analysis (word, phrase, sentence, paragraph, full text); then coding rules are developed for each category. Human coders should be trained to classify text according to specific classification standards. Individual word count systems classify text into a number of semantically equivalent categories and use frequency counts to determine the relative importance of each category in a text (Weber, 1990). Artificial intelligence systems consider the syntax and lexicon of words (Rosenberg et al., 1990), which help us to solve out the problems of words with more than a single meaning.

Words used are as a reflection of individual differences, situational and social processes and psychological changes (Pennebaker et al., 2003). For this thesis, two popular computer-aided text analysis (CATA) software, i.e. DICTION 5.0 and LIWC, were applied.

LIWC categorized 2300 words (Pennebaker et al., 2003) and data analysis will retrieve these words or word stems within a file of text and classify them in 70 linguistic dimensions such as standard language categories, psychological processes, relativity and specific content areas. From many experiments, LIWC serves as a valid approach to measure the verbal expression of a language user's emotion and cognition (Pennebaker and Francis, 1996). LIWC has been shown as a valid and reliable approach to measure individuals' psychological characteristics in the language disclosure process (Pennebaker and Francis, 1996). Even after considering the problems of using irony, sarcasm and

unusual sentence structure in texts, LIWC can still be seen as a useful method to gauge the emotional expression, intention and cognition of the writers. LIWC has been validated by having judges rate the emotion and cognition contents of thousands of texts (Pennebaker and King, 1999). LIWC is particularly useful for this thesis because it can measure some focal constructs that I plan to investigate: NE and FFA.

DICTION 5.0 is software developed by Hart and his colleagues (Hart, 2000) and widely used in strategic management and political science studies. DICTION 5.0 has 31 pre-defined dictionaries containing more than 10,000 words. It utilizes the artificial intelligence technique and provides “custom” functions for content analysis in various fields (Short and Palmer, 2008). It was designed by communication researchers and focuses on the subtle power of word choice and verbal tone (Hart, 2001). DICTION 5.0 analysis is performed only on the text format in this research. Other information such as graphics and tables are ignored. It is calculated at the word level. DICTION 5.0 assigns each word to a concept classification or theme. In the Bligh et al. (2004) evaluation of contemporary content analysis software, they believe that DICTION 5.0 is excellent software which is explicitly designed to examine the linguistic elements of leaders.

Both DICTION 5.0 and LIWC are used to analyze the raw data, i.e. CEOs' shareholder letters in this research study to extract variables for further investigation. The only source for text analysis was the CEO shareholder letters. These letters can be found in the company annual reports which have been downloaded from various places such as the company websites, T1B, Bloomberg, and Internet Archive. Using two different software packages for this research study is expected to improve the quality of the study. They can serve as a helicopter and a car, respectively, to help us learn about a city from different viewpoints (Hart, 2001). Built on these raw data and preliminary results from the

content analysis, the following three essay chapters will provide valuable insights into the CEO transition epoch. For more detail on the data extraction process and procedure for each focal construct, please refer to each individual paper in the following chapters.



**Chapter 3. Essay One: CEOs’ psychological factors and CEO turnover types**

**ABSTRACT:**

I use the psycholinguistic analysis methods to investigate how CEOs’ psychological factors influence their types of departure, i.e. voluntary and involuntary CEO turnovers in the FTSE All-Share index companies. Apart from those conventional reasons, e.g. firms’ prior performance, CEOs’ power, their future focus attention (FFA) and negative emotion (NE) provide crucial explanations determining their turnover types. Empirically, this study identifies that the level of CEOs’ FFA, signaling the planned career management behaviors, will increase the likelihood of voluntary CEO turnover. I also found that the

logy</full-title></periodical><pages>134-159</pages><volume>10</volume><dates><year>1985</year></dates><urls></urls></record></Cite></EndNote>(Snow, 1989, Hecfactors, appreciating the proactive roles of CEOs in the leadership succession process, the comprehensive views of this research help us better understand whether the departing CEOs leave their positions voluntarily or involuntarily.

### 3.1. Introduction

Chief Executive Officer (CEO) succession is an important, unique and very visible process (1994) in which predecessors leave their positions and successors commence their new jobs.<sup>13</sup> CEO turnover represents a major event for the firm and can determine its subsequent performance and strategic direction (Furtado and Karan, 1990). Generally speaking, there are three types of CEO succession: (i) involuntary CEO turnover (Shen and Cho, 2005, Wagner et al., 1984), sometimes called CEO dismissal (Wiersema and Zhang, 2011, Fredrickson et al., 1988, Haleblian and Rajagopalan, 2006), or CEO forced turnover (Chang and Wong, 2009, Campbell et al., 2011) which means the old CEO's departure is against his or her will; (ii) voluntary CEO turnover whereby the old CEOs self-select to step down voluntarily and smoothly, for example, ordinary retirement, taking up new roles internally or externally (for example, a prestigious government officer appointment), changing life style and so on; (iii) accidental CEO turnover whereby the old CEOs cannot continue their duties because of experiencing accidents, health problems or sudden death.

A majority of current CEO turnover literature represents the dismissal models (Fredrickson et al., 1988, Haleblian and Rajagopalan, 2006). This might be due to people enjoying exciting stories; most research efforts in this topic focus on studying the antecedents of involuntary CEO turnover. The other two types have not been investigated deeply. For example, for voluntary turnover (ii), those due to ordinary retirement and planned succession have not received much research attention (Shen and Cannella, 2003). For accidental CEO turnover (iii), old CEOs, boards of directors (BoDs), nor anyone else have much control over it. Much succession research has not distinguished the difference between forced and voluntary turnover (Kesner and Sebor, 1994). Even a fair number of

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<sup>13</sup> This study will consistently use the term "old CEO" for those leaving their CEO position.

recent studies use all the turnovers to represent dismissal (Rowe and Cannella, 2005, Giambatista et al., 2005, Hilger et al., 2012). By definition, the CEO turnover type classification depends on the old CEOs' own will. Existing studies hold the common assumptions that BoDs are the key decision-makers and old CEOs behave passively in determining the types of exit. Moreover, key CEO turnover models (Fredrickson et al., 1988, Halebian and Rajagopalan, 2006) are cognition based and ignore emotion as an unconscious reasoning method.

The basic assumption of previous models is that CEOs are not willing to leave their prestigious positions with great benefits (Dunford et al., 2008). In this study, taking into account the old CEOs' proactive roles, we investigate whether or not those ignored elements, i.e. the importance of their emotion in decision-making, have some impact on the types of CEO departure. Based on the dual process theory, the attention based view, and the literature in executive career management, this research attempts to investigate the types of CEO step-down from a new perspective. We found that emotion serves as another channel for the bound rational choices, particularly in the context of CEO succession where old CEOs and BoDs face cognitive limitations in the complex situations under pressure.

### 3.2. Literature review

Due to the technical difficulties to separate voluntary and involuntary CEO turnovers, many researchers actually treat all turnovers as dismissals (DeFond and Park, 1999), (Shen and Cannella, 2002). Actually, the mechanisms determining whether there will be a voluntary or involuntary turnover have not been further explored.

For an involuntary succession, the old CEOs do not plan to leave their posts and the replacements are against their own will. Forced turnover is a politically contentious

process (Vancil, 1987). There are strong conflicts between old CEOs and the board in the dismissal process (Shen and Cannella, 2002). The old CEOs decide to stay in their posts and face the challenges from BoDs; consequently, BoDs have to make their judgments to execute the dismissal. In contrast, the process of voluntary CEO turnover is smoother. Sometimes voluntary turnover is called planned succession, routine turnover or normal turnover (Helfat and Bailey, 2005). By definition, in a voluntary turnover, the old CEO takes his or her own initiative and self-selects to step down; he or she plays a key role in planning and organizing this process (Zhang and Rajagopalan, 2010). It is less destructive for the continuity of the company (Farquhar, 1994). Furthermore, in a voluntary turnover process, the old CEOs themselves are the key decision-makers. In Taylor's (2010) study of CEOs in the Forbes annual surveys, firing a CEO is estimated to cost shareholders 5.9% of firm assets, or \$254 million (\$1.3 billion) for the median (mean) in the sample. It includes the direct cost of urgently searching for a replacement, the potential cost of lawsuits, the old CEOs' golden parachute packages and so on. Compared to a voluntary CEO turnover, a forced turnover has higher losses in terms of human and social capital (Dess and Shaw, 2001) which might be taken away by the dismissed CEOs. By taking a number of trusted lieutenants away to the firm's competitors, CEO dismissal might create risks in leaking confidential strategic information and trade secrets.

Compared to a voluntary CEO turnover, in an involuntary CEO turnover, the productivity lost by firms and the top management teams (TMTs) is higher (Gibelman and Gelman, 2002). CEOs often play a connection role in a series of networks. After an involuntary CEO turnover, other TMT members will also face the pressures of disciplinary action because of the negative domino effect (Siebert and Zubanov, 2009). A dismissed CEO is more likely to sabotage and generate potential harmful consequences.

Former CEOs might possess unique monitoring and advising abilities. Recent studies found that voluntary CEO turnover is an alternative way of helping the firms retain part of the old CEOs' valuable social and human capital even after they leave their position. An example might be in retaining former CEOs on board (Evans et al., 2010) or maintaining good relationships with former CEOs who might already hold better positions elsewhere to access those resources associated with them (Hutchinson and Russell, 2013).

One key assumption of the major prior studies argues that old CEOs are reluctant to step down from their prestigious position (Goodstein and Boeker, 1991, Ocasio, 1994, Dunford et al., 2008). In fact, failing to plan is planning to fail. The CEO has been seen as a risky position and CEOs are described as "the world's most prominent temp workers" (Kaplan and Minton, 2012, Lucier et al., 2004). According to the *Wall Street Journal*, successions will sometimes be planned very early beforehand by the old CEOs voluntarily (Kaplan and Minton, 2012, Lucier et al., 2004). In some high performing firms, CEOs start to plan for their succession right after taking office (Zajac, 1990), (Shen and Cannella, 2003). In this research, we propose that we can uncap the reasons for the dichotomy of CEO turnovers by investigating old CEOs' will.

Different from previous dismissal models, the focus object of this study swings from BoDs to the departing CEOs. Old CEOs are no longer passive; taking a career development perspective, they are the key decision-makers for their own destinies. Even in involuntary turnovers, we need to consider the mechanisms supporting the old CEOs' decision to stay on in their posts and face the challenges from the BoDs (the reasons of noncooperation between old CEOs and BoDs). Hence, this study will look at the old CEOs' cognition and emotion which are supposed to have some impact on their own decisions and also on the judgment of BoDs.

Scholars believe that two common factors separating voluntary and involuntary turnovers are the firms' prior performance and the old CEOs' power (Zhang, 2008, Shen and Cho, 2005), Cheramie et al., 2007). First, poor prior performance is the main factor that increases the probability of both voluntary and involuntary turnover (Cheramie et al., 2007, Fan et al., 2007). However, for slightly better performing firms, they do not have intensive pressures to fire the old CEOs urgently and give them an opportunity to plan for their exit better. Researchers found that firms with forced CEO turnover have poorer financial performance in the year before the turnover, compared to firms with voluntary CEO turnover (Hazarika et al., 2012, Lin, 2006). Second, an old CEO's weak power will increase the chances of involuntary turnover. Old CEOs possessing high power are more likely to have their say in the succession planning for a voluntary turnover; in contrast, an old CEO's weak power will increase the likelihood of being sacked. Studies have found that powerful CEOs are able to insulate themselves from dismissal, to retire for purely voluntary reasons, and to control the process of their replacements in spite of poor performance (Pitcher et al., 2000).

Furthermore, current understanding sees old CEOs as being very passive in selecting their exit mode; little has been discussed about old CEOs' thoughts, emotions, and behaviors and in particular, their wills (i.e. their wishes and desires). We believe that these factors are crucial because by definition, whether a turnover is voluntary or involuntary depends on the old CEO's will. To understand this will, taking into consideration the career management perspective (Cheramie et al., 2007), we have to look at old CEOs' attitudes and intentions (or not) to step down.

It has been known that the cognitive process is an explicit process in decision-making, but emotion plays an important role in implicit heuristic decision-making (Evans,

2003, Gilkey et al., 2010). We have to consider both old CEOs' and BoDs' emotion infusion information processing. We propose that our research will make some contributions to the field by incorporating these important issues.

### 3.3. Hypotheses development

From a boundary-less career perspective (Sullivan and Arthur, 2006), executives are not only organizational resources, but also individuals who seek to manage their own careers by taking advantage of opportunities and by changing their jobs to maximize their success (Eby et al., 2003). Cognition and emotion are two fundamental components of the human mind that serve to activate motivation systems, mobilize resources, enhance perceptual processing, prepare for action, and assist in selecting appropriate behaviors (Bradley, 2008). Cognition is considered as rational, dispassionate, and "cold", while emotion is considered as irrational, passionate and "hot". We propose that we can use cognition and emotion to understand the ways in which CEOs respond to problems. Therefore, by taking into consideration both emotion and cognition, a better understanding will be gained for the old CEO's motives of career management.

Cognition and emotion are important common factors enabling us to gauge CEOs' motivations, intentions, commitment and enthusiasm to deal with the problems that they currently face (Piderit, 2000). Taking into account these subjective (soft) assessment variables together with objective (hard) factors such as performance and power, we can better explain the differences in CEO turnover types.

Attention is a scarce resource of CEO cognition. Attention is the process of "noticing, interpreting and focusing time and effort" (OCASIO, 1997), p.188). CEOs need to allocate their attention across competing objectives. The ways in which old CEOs' channel and distribute their attention can predict and explain their decisions not only for

the companies, but also for themselves. We propose that the nature of an old CEO's attention will be a key career management factor for their types of exit, i.e. either to leave voluntarily or to leave forcedly.

On the other hand, emotions impact on both the content and process of thinking (Forgas and George, 2001). Bazerman et al. (1998) suggest that while making a decision, people enter into a negotiation between the rational, cool-headed cognitive "should" self and the hot-headed, emotional "want" self. Not only can the "want" veto the decision of "should" self, but it may also know something important that the person has not yet realized. Hence, we propose that old CEOs' emotion is another key factor determining their exit type decisions.

In the study, we propose that the types of CEO turnover (voluntary versus involuntary) might depend not only on whether or not an old CEO really wants to (planned or not), but that it also might depend on whether or not the BoDs really have to force the old CEO out (being cooperative or not).

#### 3.3.1. Old CEOs' future focused attention & its influences

Future focus is an important CEO attention and is defined as the amount of attention devoted to events that are yet to occur (Yadav et al., 2007, Chandy, 2010). Executive career management is the active and purposeful administration of the managers' career, such as career choices and career changes (Cheramie et al., 2007). These future-focus expectations will shape the way of their choices of exit.

Zajac (1990) found that firms having CEO succession planning had better post-succession performance than those without. Although some studies show that the BoDs do not engage in rigorous and formal succession planning (Larcker, 2011), informal CEO turnover planning is very common as an important planned behavior of the old CEOs



(Zhang and Rajagopalan, 2010, Shen and Cannella, 2003). It also discloses old CEOs' willingness and intention to step down voluntarily. The intention of voluntary turnover implies that the old CEOs can plan for it more or less. In a voluntary CEO turnover, old CEOs have the opportunity to select the right time to step down, select appropriate successors and transfer their powers to them. Old CEOs' future orientation is very important for their planning in the succession process. Leaving the prestigious CEO position has big associated costs. For a planned CEO voluntary turnover, leaving the organization is less likely to be seen as a betrayal. Cognitive evaluations of future relationships with the organization will be raised. Even receiving a better offer from external organizations, the costs of image and reputation damage will be high if the old CEOs' relationships with the companies go wrong and are discovered by the public. The following arguments illustrate the importance of that old CEOs' FFA for the CEO exit types.

#### *3.3.1.1. Being proactive and prepared for the succession*

Future focus has a change-orientated nature. At the personal level, it helps old CEOs correctly interpret and predict their future career development; thus, they will be more prepared for career change. Future focus helps old CEOs develop better planning for themselves and for the firms as well. Highly future-focused individuals might be expected to be more influenced by goals, whereas others might be expected to be more influenced by feedback. As a result, it is possible that individuals high in FFA will be more committed to change because they are able to perceive the results of the future change and keep their attention on those desired end goals. Future-focused old CEOs have broader perceptions of future job characteristics and more positive attitudes toward the future

(Sutton and Griffin, 2004). We believe that old CEOs' FFA is important for themselves to achieve sustainable career development and to help the firm create dynamic capabilities.

For a voluntary CEO turnover, future-focused old CEOs are able to do more planning for their firms, making things more organized before he/she leaves. FFA helps people deal with stress, prevent adversity and generate proactive efforts (Aspinwall, 2005). In this study, voluntary turnover is a proactive and planned behavior; old CEOs who are orientated towards future goals take their initiative to prevent future adverse consequences.

#### *3.3.1.2. Self-regulation and controls*

Future orientation is a curial component of temporal self-regulation theory (Hall and Fong, 2007). In a study of people in a team setting, Waller et al. (2001) found that people with a future time perspective and high time urgency outperform others because they are more aware of the deadlines and schedules. Being in an urgent context in the succession period, we infer that old CEOs' FFA will generate time awareness for them to cope with the tight schedule. As a result, high future-focused CEOs become more organized and are able to meet the deadline set by the BoDs; they can select an

In psychology, the attention to future consequences will increase people's locus of control and lead to an achievement motivation (Strathman et al., 1994). Therefore, we believe that old CEOs' FFA will demonstrate their control over current situations and their ongoing influences on the future development of their firms. In a voluntary turnover, old CEOs are willing to leave and have certain control over selecting their successor; they can also determine the successor's extent of similarity (Hambrick et al., 1993,(Nielsen, 2009), (Zajac and Westphal, 1996). Therefore, CEOs who have high FFA will be more likely to opt for a voluntary succession.

Oppositely, low CEO FFA has less control over the succession and this is more likely to lead to unorganized behavior and missing important deadlines set by the BoDs; consequently, it can increase the chances of dismissal. Some researchers believe that those lacking FFA only perform when the deadline is approaching (Shipp et al., 2009); old CEOs with a low level of future focus tend to procrastinate; therefore, BoDs' disciplinary action have to be executed. With a low level of FFA, old CEOs will be perceived as less self-regulated, demotivated and undisciplined. Therefore, a lack of self-regulation will decrease the likelihood of self-managing voluntary CEO turnover; they tend to leave their destinies in the hands of the BoD.

**From the standpoint of BoDs,** old CEOs with a low FFA may not focus their cognitive attention on a goal. BoDs will deem old CEOs with a low level of FFA as not taking enough responsibility; less self-disciplinary CEOs are unlikely to have plans to leave voluntarily. This decreases BoDs' confidence and makes them worry about what will happen if "if tomorrow never comes". Hence, BoDs are more likely to enforce the dismissal.

#### ***3.3.1.3. Ambition and achievement***

Old CEOs with a low level of future focus are more concerned about the immediate benefits of remaining in their positions. A high level of FFA indicates CEOs' willingness to maintain their relationships with the companies even after they leave; it also indicates the possibility that an old CEO's continuity to provide support (Evans et al., 2010) to the firm even after he/she has been succeeded. Individuals with high FFA may embrace changes as they coincide with their tendency to focus on what is yet to come. Hence, highly future-focused CEOs have less difficulty in changing their current positions.

Future orientation gives people wings to soar to new heights of achievement (Zimbardo and Boyd, 1999). The CEO is the highest position in a company. Future focus is a promotion orientation in nature (Fried and Slowik, 2004). Hence, a low FFA indicates an old CEO's preference to keep the status quo and they are unlikely to leave their positions voluntarily; in contrast, a high level of future focus reflects old CEOs' motivation to a better future even after stepping down.

Research on the psychology of rehabilitation found that patients with future orientated thinking will reduce their stress and cope better with the aftermath of trauma (Holman and Silver, 1998). To cope with environmental challenges, managers have to unlearn past habits and learn to forget (Prahalad and Hamel, 1994). Placing too much attention on the past and present matters to hand would not facilitate the problem solving. Old CEOs with a low level of FFA are more likely to allow themselves to be overshadowed by current troubles. Low FFA in old CEOs indicates that they have become stuck in the firms' rigidity and inertia from past experiences. With a lower future focus, old CEOs are less adaptive and less flexible and will react passively. Therefore, they are less prepared to step down from the CEO position and this increases the chances of involuntary turnover.

Furthermore, low future orientation will generate less optimistic predictions (Buehler et al., 2005), (Kahneman and Lovallo, 1993). **From the perspective of BoDs,** low future orientated old CEOs will be immersed in current problems and will be seen as having a lack of capabilities. We assume that low CEOs' FFA will produce pessimistic projections, thereby reducing the interest of the BoDs, making it more likely to trigger the forced turnover decision.

#### 3.3.1.4. Comparison and judgment (assimilation and contrast effects)

In job satisfaction studies, highly future-focused individuals will experience an assimilation effect, whereas low future-focused individuals will experience a contrast effect (Tversky and Griffin, 1991). A contrast effect is the enhancement, relative to norms, perception and cognition (in the succession context, a contrast effect emphasizes the inflated perceptions of current CEO position, and makes old CEOs more conservative). The assimilation effect is a felt psychological closeness of social surroundings that influence self-representation and self-knowledge (in the succession context, CEOs will appreciate and be influenced by the opinions of other people around). In the case of CEO succession, if the people, particularly BoDs who are around the old CEOs, want them to leave the position, old CEOs will be more likely to leave voluntarily and cooperatively.

**To sum up**, greater FFA makes old CEOs more prepared for the succession and plan better for their careers. It increases their control over the turnover process; FFA raises old CEOs' ambition and makes them willing to shift away from their status quo. Highly future-focused CEOs will be more adaptive and flexible and have more positive judgments and perceptions about their future career and life. It increases the chance of their voluntary exit. In contrast, low FFA make old CEOs obsessed with their current CEO position; this is less likely to generate an optimistic atmosphere and less likely to help old CEOs control their career future; it shows that they are less responsible for the jobs and decreases BoDs' positive impression and judgments of them. Given the above debate, we form a hypothesis as below:

*Hypothesis 1: The old CEOs' FFA will influence their succession types. The higher the level of an old CEO's FFA, the more likely he/she will take a voluntary turnover; the lower the level FFA of an old CEO, the more likely he/she will take an involuntary exit.*

### 3.3.2. Old CEOs' negative emotion (NE) & its influences

#### 3.3.2.1. *Alternative job opportunities and psychological contracts*

The NE of old CEOs demonstrates their abilities in the job market and hence, reduces their chance of attracting alternative employment offers (Peterson, 2010). In an employee turnover study, those who have no alternative job opportunities on hand will more likely display negative emotion (Maertz and Griffeth, 2004). Without an alternative offer on hand and having less opportunity to attract external employers, they will tend to stick with their current CEO positions more.

The psychological contracts (Rousseau, 1989, Kidder and Buchholtz, 2002) are the mutual beliefs, perceptions and informal obligations between employees and the organization. In our study, the psychological contracts are the reciprocal exchanges between CEOs and BoDs. A breach of the psychological contract signaled by the NE discloses that there is a mismatch between CEOs and BoDs. Oppositely, for both old CEOs and BoDs, a low level of negative emotion is associated with mutual respect and obeying the psychological contract. A low level of NE will reduce to conflict between CEOs and BoDs which, consequently, makes them easily agree with a decent voluntary exit. Furthermore, it reflects the possibility of old CEOs' continuous support for the firm after the succession.

#### 3.3.2.2. *Contagion of old CEOs' negative emotion*

Moods and displayed emotions spread among people like viruses: they are contagious (Rapson et al., 1993). These negative emotions spread through the organization and distort members' relationships with each other (Barsade, 2002). Due to their low emotional energy (Collins, 1990, Collins, 2004), such people are seen as depressed, lacking initiative, having low solidarity and alienated by others.

CEOs' NE is very important in the interactions among TMTs (Liu and Maitlis, 2012). Emotional contagion is automatic, unintentional and unassuming (Newcombe and Ashkanasy, 2002). Leaders who have NE tend to be rated by team members as being less effective (Gaddis et al., 2004, Lewis, 2000). Bad moods will lead to uncooperative behaviors (Hertel et al., 2000). NEs displayed by a CEO generate problems by diminishing top team members' participation and cooperation (Kisfalvi and Pitcher, 2003). This in turn generates feelings of helplessness and frustration, reducing people's commitment, preventing valuable discussion (Smith and Edmondson, 2006) and altering the power and status among board members (Brundin and Nordqvist, 2008).

Therefore, in the leadership transition period, a high level NE of old CEOs decreases their ability to be involved in preparing for their succession and control over their own prosperity. Since these old CEOs have no more aces to play, they will more likely decide to stay in their current CEO position. With NE, old CEOs are unlikely to accept the BoDs' advice and will be uncooperative with the BoDs.

#### ***3.3.2.3. Anticipated emotion and reduced commitment***

People are motivated to make decisions that bring them to experience positive or avoid negative future (anticipated) emotions (Mellers, 2000, Simonson, 1992, Zeelenberg et al., 1996). Continually investing in a losing situation indicates an escalation of commitment (Staw, 1976, Brockner, 1992). Individuals' NEs are negatively associated with their escalation of commitment from coping and depressive realism perspectives (Wong et al., 2006). To cope with the NE, people normally use an "avoidance" strategy to withdraw from situations that induce NEs. This strategy is particularly adopted when the people are responsible for the prior decision (Ng and Wong, 2008).

At this stage, we believe that old CEOs' NE has made them decide to stick with their CEO positions. Because of the contagion of negative emotion, BoDs pick up the NE as well. Because BoDs hold their reasonability for prior the decision in hiring the CEOs, with **NEs passed from old CEOs**, BoDs will be more likely to select withdrawal strategies which weakens their intention to let old CEOs go decently. Thus, we propose when they are infected by old CEOs, the **BoDs' NE** can prevent them from escalating their commitment to the old CEOs (for example, they will still keep them on board after the succession). NEs also reflect the noncooperation between BoDs and old CEOs, which reduces the possibility of voluntary step-down.

#### *3.3.2.4. The influences on BoDs' information processing*

NEs influence one's information processing (Forgas, 1995, Baron, 2008). **Infected by old CEOs**, we believe that **BoDs' NE** will influence both their affective judgment and cognitive judgment systems implicitly and explicitly.<sup>14</sup> On the one hand, bad feelings can directly inform a fast affective initial dismissal decision intuitively based on heuristic cues because BoDs use their NEs as a shortcut to infer the evaluative reaction. On the other hand, via BoDs' cognitive judgment system, NEs downgrade CEOs' efficacy scores and attribute the reasons causing the crisis as being down to their old CEOs (using self-serving biases to blame others). In this way, BoDs can shift the blame away from themselves and put them onto the old CEOs (scapegoats).

The relationships between negative affect and attribution styles are important (Weiner, 1995). Negative affect can make BoDs more easily recognize negative information. For example, it makes BoDs more alert to certain bad headlines (for example,

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<sup>14</sup> There are two parallel modes of information process in human judgments and decisions (CHAIKEN, S. & TROPE, Y. (1999) *Dual-process theories in social psychology*, Guilford Publication, DAVID, P. & HIRSHMAN, E. (1998) Dual-Mode Presentation and Its Effect on Implicit and Explicit Memory. *The American Journal of Psychology*, 111, 77-87.).



scandals) in media and in gossip. We propose that the negative affect of BoDs makes them believe that poor performance attributions are permanent (problems will last a long time) and pervasive (problems happen in many places) (Ford and Baucus, 1987).

NE also reduces the alternative alertness and narrows one's perceptual fields (Baron, 1998). It reduces the frequency or quality of social contacts between decision-makers and the external world. In our case, negative moods will make BoDs less likely to ask consultants for help or external people for advice. By reducing the communication and negotiation with the old CEOs, forced turnover will bounce out as a plausible option for the BoDs.

Induced moods distort the appraisal results; it even happens in highly familiar interactions and known others (Forgas, 1994). We believe that NE will decrease BoDs' assessment scores for CEOs. Since negative affect is stable (Martinko et al., 2003), BoDs will probably believe that the causes of failure are more stable so that the forced turnover decisions will be firmer. Furthermore, with negative emotions, BoDs will generate a negative attitude towards their CEOs. When BoDs believe an old CEO is helpless and behaves uncooperatively with them, they will determine the dismissal and stop negotiating with him/her. After drawing on the final forced turnover conclusion, BoDs' NE facilitates vigilant monitoring behavior (Diamond and Aspinwall, 2003). Hence, they are more likely to make sure the implementation of forced succession in a tough way to the end.

**To sum up**, old CEOs' NE will arouse an emotional contagion spread which, in turn, will make them lose control over the succession and their career future. It makes them hold tight onto their CEO positions. Old CEOs' NE, as a signal of breaching the psychological contracts between BoDs and themselves, will generate further conflicts. Influenced by the old CEOs, the NE of BoDs will reduce their appraisal results and

commitment to the old CEOs; it will influence the BoDs' judgment about old CEOs' capabilities and attitudes, as well as motivations. The damaged impressions and communication, the NE of noncooperation between old CEOs and BoDs, will lead to an involuntary turnover. In contrast, low level old CEO NE enhances their capabilities and attitudes to arrange for the turnover preparation and career management; a lower level of NE will increase the old CEOs' chance to opt for voluntary turnover. Based on the discussions above, we develop the following hypothesis:

*Hypothesis 2: Old CEOs' negative emotion will influence the types of CEO turnover. A high level of old CEOs' NE will increase their chances of getting an involuntary turnover and a low level of old CEOs' NE will increase their likelihood of having a voluntary turnover.*

### 3.4. Methods

We selected the observations from the FTSE All-Share Index<sup>15</sup> based on the selection criteria below: 1) the succession took place from 2002 to 2007; 2) firms in non-financial and non-utility industries only; and 3) BoDs and CEOs' information and CEOs' shareholder letters were available. There were 198 CEO succession events in our sample during this time period. These succession events were identified from the Boardex and Bloomberg databases. Due to the limitations of data availability for some key variables, the final analytic model contains 166 observations in total. Within these cases, 57.2% of CEO turnovers were classified as involuntary turnovers. The average age of old CEOs in the year of succession was 54.86 years, and their average working history in the company was 10.73 years. Of the old CEOs, 12% also concurrently held chairman positions. These companies had an average of 19,709 employees and £2,680 million annual revenue on

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<sup>15</sup> The top 600s companies in the FTSE (Financial Times and the London Stock Exchange).

average. Only publicly traded companies were included because we needed to obtain the CEOs’ psychological factors using the results from psycholinguistic content analyses of CEO letters to shareholders.

We attempted to investigate those extra “soft” and “hot” factors of CEO that we believe contribute to explaining the different CEO turnover types. From a positivism perspective, control variables were entered into the analysis before new predictors, i.e. old CEOs’ FFA and NE whose effects we are primarily concerned with. The comparisons among different models can help us better appreciate these additional influences.

### 3.4.1. Constructs and Measurements

Table 3.1: Summary of constructs, variables, measurements and sources

Constructs/definitions	Variables	Operationalization	Sources
<b>Outcome construct</b> <i>CEO succession:</i> CEOs step down against their own wills or not	<i>Turnover type:</i> 1 (involuntary turnover) 0 (voluntary turnover)	CEO age $\leq 63$ , stripped board membership, No better afterward appointments	Boardex Bloomberg Nexis UK Factiva
<b>Focal constructs:</b> <i>Future focused attention:</i> The amount of a CEO’s attention devoted to objects and things that are yet to occur. <i>Negative emotion:</i> The intensity of the negative feelings/moods expressed by CEOs	<i>FFA</i> % of words related to future in a text	Extracted from the content analysis results of LIWC	CEO shareholder letters
	<i>NE</i> % of words related to negative emotion in a text	Extracted from the content analysis results of LIWC	
<b>Controlled prior focal constructs</b> <i>Prior performance</i>	<i>ROS (ROA, ROETOT)</i>	Firms’ performance one year before succession	TIB
<i>CEO power</i>	<i>CEO duality</i>  <i>Board size</i> <i>CEO age</i> <i>Years in the firms</i>	CEOs also act as Chairman; Number of directors; Age of the CEO; Number of years a person worked for the organization	Boardex Bloomberg
<b>Other controlled factors</b>	<i>Firm size</i>  <i>Debt to asset ratio</i> <i>Time and industry effects</i>	Logarithm of firms’ total asset (Debt/asset)*100% Year and industry dummies	TIB

Table 3.1 summarizes the definitions of constructs, variables, operationalization and data sources of our dependent, independent and control variables.

#### 3.4.2. Dependent variable- CEO turnover types

We adopted two parallel methods recommended by some well-known previous studies to separate involuntary and voluntary CEO turnovers (Shen and Cannella, 2002), (Zhang, 2006). First, an explicit approach: we collected three continuous years' news in Nexis UK for the old CEOs from one year before to one year after the succession. If the news showed that those CEOs 1) were directly reported as being fired, or 2) had resigned unexpectedly or immediately, or 3) took early retirement due to undisclosed personal reasons, we then coded these cases as involuntary turnover. We identified 76 fired CEOs using this method. The second approach is a calculation-based approach; we used the age of old CEOs and the continuity of their board memberships at the time of succession as indicators. If the old CEOs' age was lower than or equal to 63 when they left the CEO position without retaining their board memberships, then we classified them as a suspected dismissal. Based on these suspected results, particularly for those misaligned with identified firms using the first methods, we checked 1) whether or not the old CEOs had been appointed as CEOs or to higher positions in other organizations after the turnover; 2) whether such succession was due to death, health problems, or merger situations. Using the second method, I generated 112 CEO involuntary turnover cases and 81 voluntary turnover cases, 193 in total (because of the data availability of some variables, the final analytic model retained 166 cases). The involuntary cases identified by the second method cover all the cases identified by the first one. Therefore, we applied the second method to code our dependent variable dichotomously: involuntary CEO turnover as 1, voluntary turnover as 0.

### 3.4.3. Independent and control variables

#### 3.4.3.1. *Focal (independent) variables*

CEOs' letters/reviews/statements in the annual reports serve as raw data for our focal variables, FFA and NE. We used a predefined psycholinguistic program LIWC (Pennebaker et al., 2001) to extract these variables. LIWC has been proved as a valid and reliable approach to measure cognition, attention and emotion in the language disclosure process (Pennebaker and Francis, 1996). Even after considering the problems of using irony, sarcasm and unusual sentence structure in the texts, LIWC can still be seen as a reliable method to gauge the emotional expression and cognition of the writers. The CEOs' shareholder letters were content analyzed via matching words in various categorized dictionaries built into the LIWC program. LIWC calculates the percentage of words associated with one particular dictionary in the total number of words of a letter; thus, it controls the length of the writing sample (Kahn et al., 2007). The negative emotion dictionary comprises 345 words (such as hate, worthless, enemy, fear, anger and sadness) that reflect the intensity of CEOs' negative feelings and emotions. FFA is measured using the future tense category dictionary in LIWC, which includes 48 words such as will, might, shall, gonna, and so on. It reports the amount of CEOs' attention devoted to events and things that are yet to occur.

#### 3.4.3.2. *Control variables*

As discussed in the theory and hypotheses section, poor prior performance and CEOs' weak power are two key factors leading to different types of CEO turnover. For performance, in this study we use ROS (return on sales) which is expected to have a negative impact on CEO involuntary turnover (Cannella et al., 2008). We also control those characteristics signaling old CEOs' power such as CEO duality (the CEO also acts as a chairman at the same time), CEOs' age and the number of years they worked for the

company (number of years since he/she first joined the organization); we expect all these factors will negatively relate to CEO involuntary turnover.

We control for board size, i.e. the total number of directors on the board (Zajac and Westphal, 1996); we also control the firm size (measured by the firms' total assets (logarithm) since some researchers show that larger firms would like to retain their old CEOs as board members (Evans et al., 2010) and managers are more entrenched in large companies (Chang and Wong, 2009). We control for the capital structure (leverage, measured as the debt to asset ratio) because debtors play an important role in disciplining underperforming managers (Jensen, 1986). We also control for year and industry effects using dummy variables.

All these independent variables and control variables are lagged one year in all analyses. In other words, for the causality, the types of CEO turnover will be predicted by the values of all the independent and control variables one year before the turnover.

### 3.5. Data analysis

To test our hypotheses, we adopt the most popular analysis method, logit regression, for studying top executive succession (52.1% of empirical studies use logit regression methods, according to a systematic review) (Hilger et al., 2012). Logit models have been broadly used in this field and these methods will make our results comparable with others. The dichotomous nature of our dependent variable determines the suitability of a logit model. The main purpose of this study is to examine the importance of additional "soft" and "hot" factors while appropriately controlling for other prior recognized important factors. Initially, two separated analyses of old CEOs' cognition and emotion were conducted. Subsequently, a combined model of both cognition and emotion was tested. By so doing, we were able to examine the relative explanatory power of old

CEOs’ FFA and NE which are two distinct elements of a dual channel perspective. We were also able to explore the individual contribution of each variable in our combined model.

Due to there being some missing values (some of the information from a few companies is not publicly available) for some variables, we finally included 166 cases into our logit regression model:

$$\ln\left(\frac{p}{1-p}\right) = X'\beta \quad \text{or} \quad \Pr(y=1|x) = \frac{\exp(\alpha+\beta x)}{1+\exp(\alpha+\beta x)}$$

Table 3.2: Data description and correlation

Variables	Means	S.D.	1	2	3	4	5	6	7	8	9
1.Turnover type	0.572	0.496	1								
2.ROS	5.369	18.46	-0.10*	1							
3.Firm size	6.222	1.630	-0.01	0.33*	1						
4.Board size	4.392	1.887	-0.09	0.01	0.22*	1					
5.CEO duality	0.120	0.327	-0.28*	-0.05	-0.15*	0.14*	1				
6.DTA	22.49	19.61	-0.02	0.08	0.16*	0.02	-0.06	1			
7.CEO age	54.86	6.653	-0.30*	0.15*	0.21*	-0.04	0.18*	-0.05	1		
8.Years in firm	10.73	8.525	-0.25*	0.09	0.07	0.19*	0.12	-0.03	0.21*	1	
9.FFA	0.650	0.325	-0.04*	0.08	0.11	0.04	-0.17*	-0.04	-0.06	-0.19*	1
10.NE	0.806	0.422	0.18*	-0.05	-0.05	0.05	0.01	0.02	0.00	0.02	-0.19*

Notes: n=166; Significance level: \* p < 0.05

Table 3.2 reports the means, standard deviations and Pearson correlations of all observed variables in the regression. The CEO involuntary turnover type is significantly correlated with two independent variables, FFA and NE. Involuntary turnover also significantly correlates with most of our control variables related to performance and power. No serious multicollinearity problem has been detected so far, since no correlation of two or more predictors was greater than 0.4.

Table 3.3: Logit model of CEO turnover types

Turnover type	(1) Control	(2) FFA	(3) NE	(4) Full
Performance	-0.0317+ (0.021)	-0.0348 (0.024)	-0.0257 (0.020)	-0.0291 (0.023)
Firm size	0.0766 (0.139)	0.0754 (0.141)	0.0930 (0.141)	0.0887 (0.146)
Board size	-0.0509 (0.098)	-0.0528 (0.100)	-0.0544 (0.098)	-0.0562 (0.100)
CEO duality	-1.692* (0.758)	-2.027** (0.741)	-1.714* (0.748)	-2.008** (0.761)
Debt asset ratio	-0.00622 (0.010)	-0.00656 (0.012)	-0.00637 (0.011)	-0.00630 (0.013)
CEO age	-0.106** (0.038)	-0.104** (0.038)	-0.112** (0.038)	-0.110** (0.038)
Years in the firm	-0.0424+ (0.024)	-0.0522* (0.024)	-0.0504* (0.025)	-0.0575* (0.025)
FFA		-1.191* (0.606)		-0.948* (0.626)
NE			1.374** (0.461)	1.269** (0.467)
_cons	6.504** (2.352)	7.624** (2.461)	6.126* (2.446)	7.038** (2.551)
N	166	166	166	166
df m	19	20	20	21
chi2	35.26	37.81	45.69	45.97
p	0.01	0.009	0.001	0.001
r2 Pseudo	0.189	0.206	0.227	0.237

Notes: Standard errors in parentheses, +  $p < 0.1$  \*  $p < 0.05$  \*\*  $p < 0.01$ . The reported coefficients in the table are unstandardized; dummies variables are omitted.

Table 3.3 reports the results of logit models of CEO turnover type using maximum likelihood estimations. The maximum likelihood (MLE) is the preferred estimator especially for our small sample size ( $N > 100$ ) (Long and Freese, 2006). The analytic structure is: Model (1) is a baseline model which includes only control variables. Model (2) includes all control variables and FFA. Model (3) includes all control variables and CEOs' NE. Model (4) is the full model including all control variables, FFA and NE together. Numbers in parentheses are the standard errors of coefficients. The significant p-values of Wald statistical tests of all four models are less than .01, helping us to reject the null



hypotheses that all of the coefficients are equal to zero. These indicators show that the independent variables of four models have significant effects on determining a CEO involuntary turnover. The Pseudo R-squares demonstrate that by either adding our independent variables one by one separately or together simultaneously, the goodness of fit of models (2), (3) and (4) are increased significantly compared with the baseline model. The final model (4) has the best explanatory power to classify two types of CEO exit.

When there is a positive regression coefficient, the transformed log value will be greater than one. It means that the modeled event is more likely to occur. In contrast, when negative coefficients transformed log value is less than one, the odds of an event occurring will decrease. We discover that some prior recognized variables (control variables), i.e. CEO duality, CEO age and years, worked in the firm have negatively significant impacts on the likelihood of CEO dismissal against the voluntary turnover across four models. These fit well with our original assumptions that they will reduce the CEO involuntary turnover possibility in the total turnover cases.

In the logit model, the natural logarithm of odd ratios  $\left(\frac{p}{1-p}\right)$  of a CEO being forced out is a dependent variable in this regression equation. The coefficients represent the influences on the logarithmic odds ratios of involuntary turnover versus voluntary turnover. Hypotheses 1 and 2 suggest that a higher level of old CEOs' FFA predicts voluntary turnover and a high level of old CEOs' NE predicts involuntary turnover, respectively. The coefficients of our independent variables, FFA and NE, are significant in the proposed directions; the findings support both hypotheses. These relationships were consistent across the model (2), (3) and (4) as well.

In the final model (4)  $\hat{\beta}$ MLE in Table 3.4 shows that if negative emotion increases 1 the log-odds-ratio of CEO involuntary turnover will increase 1.269; and if the FFA

increases 1, the log-odds-ratio of CEO involuntary turnover will decrease 0.948. It is difficult to interpret the results of  $\hat{\beta}_{MLE}$ . To understand the coefficients of logged odds ratios by logit models better, we transform the logged odds ratios into their impacts on probabilities: the marginal effects of FFA and NE on involuntary turnover. We can explain how our independent variables influence the CEO dismissal probability via marginal effects using the equation below:

$$\text{Marginal change} = \frac{\partial \text{Pr}(y=1|x)}{\partial x_k}$$

These relationships between probability of involuntary CEO turnover and FFA and NE are nonlinear, the tangent to the probability curve will illustrate these effects. In the final model (4), the overall  $\chi^2$ - model's goodness of fit is 45.97\*\*\*. For the final model, we use the “mfx” program in STATA to calculate the marginal effects of future focus and negative emotion on the probability of dismissal and holding all the variables at their means. The marginal effects are -0.227 and 0.304, respectively. This means that that one unit change in these two variables will significantly change the probability of involuntary turnover by -0.227 and 0.304, respectively.

Apart from the Pseudo R-squares which are displayed in Table 3.3, we also checked the BIC results to measure the fit of our models using the “fitstat” program in STATA. The  $\Delta BIC$  difference between the full model and the baseline is 5.344, which shows good evidence (Raftery, 1995) of improvement. Our final model works well to predict the CEO succession types and can explain the difference between involuntary and voluntary turnover samples. With “soft” and “hot” factors, the explanatory power of our model for CEO turnover type has been increased, or in other words, including cognition and emotion of old CEOs in the regression can achieve a better model fit.

Table 3.4: The classification accuracy of the logit regression model

Classification		Predicted		Total
		Dismissal	Non-dismissal	
Observed	Dismissal	77	27	104
	Correctly predicted dismissal	74.04%		
	Non-dismissal	18	44	62
	Correctly predicted non-dismissal		70.97%	
Overall	Total	95	71	166
	Correctly classified	77	44	121
	Correct classification rate			72.89%

To evaluate the quality and utility of our final model, Table 3.4 provides the classification accuracy results comparing the predicted involuntary/voluntary turnover memberships based on our logit models with the actual fact. Our model can 74.04% correctly predict the CEO involuntary turnover and 70.97% correctly predict voluntary CEO succession. The overall classification accuracy rate is 72.89%. Operationally, the overall classification accuracy rate should be 25% or higher than the proportional by chance accuracy rate. The threshold accuracy of a good model here is 63.81%.

$$1.25 \times \left[ \left( \frac{95}{166} \right)^2 + \left( \frac{71}{166} \right)^2 \right] \times 100\% = 63.81\%$$

The classification accuracy of our model is 9.08% higher than the threshold accuracy of a satisfied model by chance. Compared with some similar studies such as Cannella (1994) and Hatfield et al (1999), the accuracy rates of their results are around 60%; few previous studies reach accuracy above 70%. We believe that the quality of our logit model is good with a relative higher accuracy rate.

3.6. Discussions and Conclusions

Existing studies widely treat the old CEO as a passive player in determining his/her mode of exit. Lack of research has investigated the importance of the psychological factors of the old CEOs, particularly their emotion in the leadership

transition period. This study was motivated by the need to address these theoretical gaps in the CEO succession literature.

Although by definition it depends on old CEOs' will to separate two different types of exit, voluntary and involuntary turnovers, previous studies neglect the old CEOs' initiative. To fill this blank, we adopted a dual channel platform integrating both cognition and emotion to test the importance of old CEOs' psychological factors in leading to different types of CEO exit. We propose that the level of old CEOs' FFA, signaling the planned career management behaviors will increase the likelihood of voluntary turnover compared to involuntary turnover. We also propose that the level of old CEOs' NE, reflecting the noncooperation between old CEOs and BoDs, will increase the likelihood of involuntary turnover compared to the voluntary turnover. The empirical findings provide robust support to these claims by considering them in the logit models individually or by considering them together in the final model. In our research context, old CEOs' power, proxy as CEO duality, age and years worked for the companies remain their significant influence in increasing the likelihood of voluntary turnover across all models. After considering our focal constructs, FFA, NE or both respectively, the firm performance lost its significant impact on reducing the likelihood of involuntary turnover compared with voluntary turnover. This implies that the importance of prior performance will be diluted after considering the effects of old CEOs because it is down to how old CEOs' appreciate and respond to it. Hence, FFA and NE can grasp more explanatory power.

This study contributes to the current literature in CEO succession as follows. 1) From a theoretical view, current CEO succession literature emphasizes the environmental and economic rational decision of BoDs and treats old CEOs as passive objects in determining the types of their exit. This study introduces the integration of an executive

career management perspective and appreciates the proactive roles old CEOs play in the leadership transition process; 2) from an empirical view, based on the dual channel theory, this study provides strong evidence for the importance of old CEO's psychological factors, particularly emotion as a widely ignored element in explaining the dichotomy of CEO turnover types; 3) the majority of extant CEO succession studies were conducted in the USA and this study can serve as a supplement in the new geographic area.

For future research, by taking into consideration old CEOs' proactive roles in the succession process, it will better to conduct some supplemental qualitative research such as collecting data from interviews from both old CEOs and BoDs. Further investigation of the interactions between old CEOs and BoDs in their meetings and communications will help us discover more robust evidence and interesting stories behind this process.

In conclusion, previous research into CEO turnover has ignored the old CEOs' initiative. This study offers an alternative view by investigating old CEOs' willingness to step down using their FFA and NE which advanced our knowledge in this field.

## **Chapter 4. Essay Two: The impacts of new CEOs' psychological factors on post-succession strategic change**

### **ABSTRACT:**

I use the psycholinguistic content analysis methods to investigate how new CEOs' psychological factors influence the post-succession strategic changes (PSSC) of firms in the FTSE All-Share index. Taking the trilogy-of-mind perspective, on top of cognition, I advocate that new CEOs' emotion and conation serve as the impetus for the PSSC. By tracing the identical new CEOs over years after their succession in a non-experimental field study, the empirical results of this longitudinal study demonstrate that those intra-individual psychological (time-varying) factors of new CEOs are important for the PSSC. New CEOs' future focus attention (FFA), commitment to change (C2C), will significantly increase the PSSC and the new CEOs' negative emotion (NE) will significantly reduce the PSSC. The paper claims that incorporating more comprehensive factors in new CEOs' trilogy of mind can help us get a better picture for the mechanism behind PSSC.

#### 4.1. Introduction:

Rajagopalan and Spreitzer (1997) define a strategic change as the difference in form, quality and state of an organizational entity's alignment with its external environment over time, i.e. the fundamental pattern of present and planned resource deployments (Hofer and Schendel, 1978). It can happen in both the content and the process of strategies. From a reactive point of view, a firm's strategies are forced to change by its environment. However, it is people who make the difference. We also have to consider factors within a firm, particularly the characteristics and the mind of its CEO. When facing similar challenges in the environment, firms respond differently due to their managers' particular inspirations and decisions. CEOs' capabilities to make appropriate strategic changes (the right direction, the right scope, the right degree and at the right time) are the major sources of competitive advantage for a firm.

The CEO succession is an important event in the history of any company and is a potential trigger for strategic change (Miller, 1993). Previous studies show that new CEOs will initiate substantial strategic change upon taking office, particularly when they have different mind-sets from their predecessors (Shen and Cannella, 2002, ZUNIGA-Vicentea et al., 2005). CEO succession opens a window through which we can examine differences in the mind-set between the predecessor and successor. It also gives us a chance to explore how a new CEO's mentality, i.e. the intra-individual (time varying) differences within identical new CEOs change in the following years.

Although there is vast literature on strategic change, only a small number of empirical studies have focused in the context of CEO succession (Hutzschenreuter et al., 2012). The nature of the strategic change after a CEO succession has not been sufficiently explored. The basic assumptions of the current literature are rooted in 'bounded rationale'

(Simon, 1955) and in the Upper Echelon Theory (UET) which deems managers having strong impacts on the strategic choices of their firms (Child, 1972, Hambrick and Mason, 1984). However, managers have only a limited capacity to handle all the information in their environment (Cyert and March, 1963); they normally have to impose a cognitive map, a mental template for transforming a complex informational environment into a tractable one. Hence, CEOs' cognitive limitations and differing cognitive maps will influence their strategic decision-making.

Current psychological studies predominantly focus on "cold cognition" in which affect plays little role (Anderson, 1996, Forgas, 1995), while emotion and conation (a commitment pathway from intention to action (Snow, 1989, Heckhausen and Kuhl, 1985) have been broadly ignored (Reitan and Wolfson, 2000, Hannah et al., 2011). Accordingly, cognitive psychology has been the most widely employed perspective for understanding the mechanism of post-succession strategic change (PSSC).

Current cognition dominated research in the field will hamper the development of studies in PSSC. By incorporating previously ignored factors in the trilogy of mind (Hilgard, 1980, Mayer et al., 1997), i.e. emotion and conation into the models, we expect to have a better understanding of the phenomenon. Different from existing research which mainly investigates the cognitive differences between predecessors and successors, this paper intends to look at the intra-individual (time-varying) differences within the identical new CEOs. This study attempts to demonstrate the importance in the change of a CEO's psychological factors, i.e. cognition, emotion and conation, for the PSSC.



## 4.2. Literature review

Strategic changes have been seen as important reasons for the survival and success of organizations (Cho and Hambrick, 2006). Normally, we can categorize the antecedents of PSSC from both internal and external angles. For those factors that initiate strategic changes from within new leaders, we call them internal causes; factors that induce strategic changes externally in new leaders are external causes (Hutzschenreuter et al., 2012). Prior research has focused on how external factors such as environmental pressure and the technical dynamic and turbulent industry characteristics (Gordon et al., 2000) impact on strategic changes. More and more studies address the importance of internal issues such as CEOs' cognition (Walsh, 1995), information processing and decision-making (Wiersema, 1992, Wiersema, 1995), learning activities (Rajagopalan and Spreitzer, 1997), and openness to change (Datta et al., 2003). Managers' perceptions of the necessity of strategic changes should be the first step towards those changes (Cho and Hambrick, 2006); without such an awareness, external environments are irrelevant to the organization.

In previous studies, cognitive differences and cognitive rigidity are two main reasons to explain post-succession strategic change (PSSC). First, the cognitive differences between the successor and the predecessor is the key internal antecedent (Hutzschenreuter et al., 2012, Boeker, 1997a, Boeker, 1997b). Second, new CEOs have less of a burden of cognitive rigidity. New CEOs may not be so committed to prior strategic directions because they did not hold responsibility for the old strategies (Datta et al., 2003). As such, they can carry out immediate strategic changes to protect the old strategies (Lant et al., 1992); (Romanelli and Tushman, 1994, Wiersema, 1992). Thus, they can easily adjust the firms' strategies to realign them with the new environment.

According to the trilogy-of-mind theory, there are three key categories in human psychology: cognition (thought); affect (feeling); and conation (desire) (Hilgard, 1980). Cognition is the information processing part of human psychological functioning (Walsh, 1995); emotion is subjective and conscious, as a transient intense state and reaction to an event, person or entity (Rajah et al., 2011); and conation is the aspect of the mental process that elicits and directs behavior and action (Huitt and Cain, 2005). Researchers have suggested that cognition, emotion and conation are three distinct functions within the brain (Reitan and Wolfson, 2000). Although cognition is a very important concept in psychology, particularly in representational models and computations (Stubbart, 1989), it is not the only component of the human mind. Based on its analogy with information processing logic, as with mathematical calculation and inference, cognition is too “cold” (Abelson and Clarke, 1963, Redlawsk, 2002). To paraphrase a well-known quotation, the wish is the father to the thought, and we are slaves to our emotions (Damasio, 1994). We might expect thoughts and decisions to be influenced by an individual’s conation and emotion.

If we emphasize a time primarily within understanding, feeling or intention, some components of the total experience are subordinated, and the psychological reality is incomplete. Not until recently did researchers start to realize the importance of affect and conation on leaders’ behaviors and organizational changes (Szabla, 2007, Johnson, 2008, Piderit, 2000). Furthermore, these psychological factors are time-varying within individuals. Following on from this realization, we propose that if we can integrate these fundamental psychological elements, particularly the intra-individual differences of the trilogy, we will have a better scheme by which to illuminate the mechanisms underlying PSSC.

### 4.3. Hypotheses development

#### 4.3.1. Cognition

The main purpose of strategic management is to plan for the future (Mosakowski and Earley, 2000). Future focus attention (FFA) is an important cognition for CEOs and is defined as the amount of attention devoted to events that are yet to occur (Yadav et al., 2007, Chandy, 2010). In a succession context, it reflects new CEOs' expectations about the future destinies of their companies. These expectations shape the way of their strategic management. The current rent stream will be corroded in the future (Mahoney and Pandian, 1992); therefore, after inception, the new CEOs' FFA is important for companies to achieve sustainability and create dynamic capability. Future focus has a change-orientated nature; hence, it makes new CEOs realize their firms' limitations in current capability and knowledge and makes them promote learning activities. New CEOs' FFA will dissolve the firms' rigidity and inertia from past experiences. With greater future focus in the new CEOs' attention, firms are more adaptive and flexible; thus, new CEOs will respond to the environmental challenges with sophistication. FFA helps new CEOs identify and interpret the developmental trends. Perceptions of novel uncertainties and upcoming issues for the firms are generated from new CEOs' FFA. Future focused new CEOs will develop more detailed scenarios and alternative solutions for the problems that firms are facing. Therefore, they can conduct strategic changes to conquer these difficulties.

In psychology, the attention to future consequences will increase people's locus of control and lead to an achievement in motivation (Strathman et al., 1994). Therefore, we believe that new CEOs' FFA will increase their control over their new positions in the

firms and make them more motivated to speed up the strategic changes. We suggest that highly future focused new CEOs can bring more changes in their companies.

Researchers studying the psychology of rehabilitation found that patients with future orientated thinking will reduce their stress and cope better with the difficult time (Holman and Silver, 1998). A new CEO's FFA as an indicator shows that he/she does not get stuck in the power transition process and signals that he/she is able to deal with the unforeseeable painful shocks in the new position. Future orientation gives people wings to soar to new heights of achievement (Zimbardo and Boyd, 1999). Future orientated focus will more actively attend to emerging information about the competitive contexts, resulting in greater degrees of change in 'high tech' startups (West Iii and Meyer, 1997). Future orientation generates some optimistic predictions (Buehler et al., 2005), (Kahneman and Lovallo, 1993). These optimistic projected claims will be more likely to make the top management teams (TMTs) and boards of directors (BoDs) agree to facilitate the strategic changes and new CEOs will also be more likely to win the support of employees. FFA is a curial component of temporal self-regulation theory (Hall and Fong, 2007). FFA will help people deal with stress, prevent adversity and generate proactive efforts (Aspinwall, 2005). Being in a future focused state, new CEOs are more self-regulated, motivated and disciplined. We believe that new CEOs' FFA can help them achieve better preparations for alternatives, better planning and problem solving; it assists them to create an optimistic atmosphere and motivate others to take action for change. To sum up, we generate the following hypothesis:

***Hypothesis 1: There is a positive relationship between new CEOs' future focus attention and the post-succession strategic change. New CEOs' future focus attention will***

*influence the post-succession strategic change: an increase in the future focus attention will increase the degree of strategic changes; a decrease in future focus attention will decrease the degree of strategic changes.*

#### 4.3.2. Emotion

Researchers have found that people's feelings and moods have a direct effect on their behavior (Forgas and George, 2001). We argue that the emotions of new CEOs will not only influence their own abilities, attitudes, leadership styles, and power in PSSC, but also other people's roles in changing the firms' strategies.

Negative emotion (NE) influences one's information processing (Forgas, 1995, Baron, 2008). We believe that NE will influence both the affective judgment and cognitive judgment systems of new CEOs implicitly and explicitly. NEs reduce the substitute alertness and also narrow one's perceptual fields (Baron, 1998). NE reduces the frequency and quality of social contact between decision-makers and the external world. For this reason, it decreases the number of alternative strategic options for firms. In this research, negative moods will make new CEOs less likely to ask for help from consultants and external people for advice. Thus, NE decreases the possibility of initiating and implementing strategic change. In contrast, less NE in new CEOs is associated with charismatic leadership (Johnson, 2009), which will potentially enhance PSSC.

The relationships between negative affect and attribution styles are important (Weiner, 1995). The negative affect of new CEOs will lead them to believe that there are bigger and more pervasive problems in the firms (Ford and Baucus, 1987). Therefore, it will make them lose confidence and give up any attempt to make strategic changes. Furthermore, with NEs, new CEOs will generate a negative attitude towards their new job.

They will feel uncomfortable, helpless and hopeless, and become inactive in their new position.

Leaders' displayed emotion is very important for the interactions among team members (Liu and Maitlis, 2012). Leaders who express NEs tend to be rated lower by team members as being less effective (Gaddis et al., 2004, Lewis, 2000). As the new leader of the company, a new CEO with NEs (psycholinguistic signals in CEO shareholder letters) will receive low respect and rating from his/her colleagues, subordinates and other stakeholders.

The NEs of new CEOs will generate low emotional energy (Collins, 1990, Collins, 2004), which makes them depressed, lack the initiative to make an effort, and low solidarity and finally, they might be alienated by other people in the company. As with viruses, moods and emotions spread among people and this phenomenon is called emotional contagion (Rapson et al., 1993). New CEOs' emotions will spread through the organizations; the NEs of new CEOs can distort members' relationships through the spread of negative energy among the group (Barsade, 2002). Other TMT members and employees of the firms will also have negative moods by contagion. Bad moods will lead to uncooperative behaviors (Hertel et al., 2000). NEs displayed by a new CEO produce problems such as diminishing top team participation and cooperation (Kisfalvi and Pitcher, 2003); generating feelings of helplessness and frustration, preventing valuable discussion (Smith and Edmondson, 2006); altering the power and status relations among board members (Brundin and Nordqvist, 2008). All these above will hamper the implementation of strategic changes. Based on the discussions above, we produce the following hypothesis:

***Hypothesis 2:** Negative emotions of new CEOs will negatively associate with the degree of post-succession strategic change; an increased level in the negative emotion will decrease the degree of post-succession strategic change and a decreased level in the negative emotion will increase the degree of post-succession strategic change.*

#### 4.3.3. Conation/Intention

Conation is a commitment pathway from intention to action (Snow, 1989, Heckhausen and Kuhl, 1985). Conation includes motivation (initiate) and volition (insist) from wishes to wants, from intentions to actions. Conation ignites people's motives to do something and it also maintains people's volition to make sure things happen as planned. Datta et al. (Datta et al., 2003) found that new CEOs' openness to change will decrease strategic persistence. Openness to change in their research is defined as a cognitive characteristic, proxy by their demographic indicators, representing being less bound to existing routines and assumptions. Researchers in cognitive schools rarely separated managerial cognition and managerial actions towards strategic changes (Rajagopalan and Spreitzer, 1997). We believe that conations acting as the pathways to action in our research can fill this gap.

Salancik (1977) defines commitment as the blinding of an individual to behavioral acts. Commitment to Change (C2C) is an action commitment; it is not directed to static entities such as teams or organizations. Prior research has treated it as the employees' attachment to the implementation of new work rules, policy programs, budgets, technologies and so forth (Jaros, 2010). C2C is a reflection of the internalization of a change program. It is to examine people's willingness to support the change. Fedor et al. (2006) believe that C2C is an individual's conation to act on behalf of the changes. It reflects people's belief, desire, and obligation towards changes in organizations

(Herscovitch and Meyer, 2002). In our study, C2C is a CEO-level construct which demonstrates the intention of new CEOs to initiate and implement strategic changes.

Intentions are a representation of commitment due to their established association with actual behaviors (Ajzen, 1987). We need to understand CEOs' intentions for strategic changes. In other words, to carry out strategic change, new CEOs must have the intention to do so. The conation perspective suggests that whether or not an action will be taken depends on an individual's intentions. The higher degree of conation, the more likely strategic cognition will be converted into strategic action.

We need to understand people's desire and belief about their actions. New CEOs' C2C will show their motivation to push forward the strategic change. Thus, the higher the degree of C2C a new CEO has, the more motivated he/she will be and the more likely he/she will put it into action. The C2C of a new CEO also shows his/her volition towards strategic changes. It infuses vigilant monitoring for the implementation of strategic change. To conclude, we develop the following hypothesis.

***Hypothesis 3: An increase in a new CEO's commitment to change will generate a greater degree of post-succession strategic change; a decrease in a new CEO's commitment to change will decrease the degree of post-succession strategic change***

Based on our discussion above, the trilogy-of-mind theory promotes a wider view to study human mental functions. If we emphasize a time primarily within understanding or feeling or intention, some components of the total experience are being subordinated, and the psychological reality is incomplete. Not until recently have researchers started to realize the importance of affect and conation for leaders' behaviors and organizational changes (Szabla, 2007, Johnson, 2008, Piderit, 2000). Thus, we propose that if we can



integrate these three distinctive psychological elements, we can understand the mechanism behind PSSC better.

#### 4.4. Methods

##### 4.4.1. Research design

This research is a longitudinal study and has three goals: (1) to improve the theoretical understanding of PSSC and new CEOs' psychological changes; (2) to make methodological advancements by applying psycholinguistic content analysis and panel data models in strategic management; and (3) to extend PSSC studies to a geographical area (non-US) which prior research has not yet covered. We attempt to take a more comprehensive view of new CEOs' psychology for a better understanding of the PSSC mechanism. The results will bring us some insight into internal driven PSSC.

We selected the companies from the FTSE All-Share Index<sup>16</sup> based on the criteria below: 1) the CEO succession took place from 2002 to 2007; 2) non-financial and non-utility industrial firms only; 3) both BoD and CEOs' information was available; and 4) CEOs' shareholder letters were available for the next 3 continuous years after the succession. Because of the data availability of some key variables, the final model in fixed effects analysis contains 116 companies in total. Within these companies, the average age of new CEOs in the succession year is 49.16 years. The number of directors on the board ranges from 2 to 9. These companies had 17,676 in the average employee number and £3,913 million in the average annual revenue. Only publicly traded companies were included because we needed to obtain the CEOs' psychological factors from the results of a psycholinguistic content analysis of CEOs' letters to shareholders. Table 4.5 provides

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<sup>16</sup> The top 600s companies in the FTSE (Financial Times and the London Stock Exchange).

the definitions, the constructs and variables, the measurements (operationalization), and the data sources used for this research.

Table 4.5: Summary of Measures and Sources

Constructs/definitions	Variables	Operationalization	Sources
<b>Outcome construct:</b> Strategic changes:	<i>Strategic change (variation)</i>	The difference between actual resource allocation and predicted patterns in time series	Bloomberg T1B/Datastream
<b>Focal constructs:</b> Future focused attention:	<i>FFA</i> The amount of a new CEO's attention devoted to objects and things that are yet to occur.	Words related to future in a text. From the LIWC results	CEO shareholder letters
<i>Negative emotion:</i>	<i>NE</i> The intensity of the negative feelings/moods expressed by new CEOs	Words about negative emotions in the CEO letter. From the LIWC results	
<i>Commitment to Change</i>	<i>C2C</i> The willingness and intention of new CEOs to initiate and implement strategic changes	Words related to change, extracted from the content analysis results according to a C2C dictionary we developed	
<b>Controlled important constructs in prior studies</b> <i>Performance</i>	<i>ROA</i>	Firms' performance (return on assets)	T1B
<i>CEO power</i>	<i>CEO ownership</i>	New CEOs' equity ownership ratio in the whole BoDs	Boardex Bloomberg
	<i>Board size</i>	Number of directors	
	<i>CEO age</i>	Age of the new CEOs	
<b>Other control factors</b>	<i>Firm size</i>	Logarithm of firms' total employee number	T1B Bloomberg
	<i>Slack resources</i>	current ratio = (current assets/ current liabilities)*100	
	<i>Environmental Dynamism</i>	the annual growth rate of industry total sales	
	<i>Time effects</i>	Year dummies	

#### 4.4.2. Key constructs and variable measurements

##### 4.4.2.1. Focal constructs (*Dependent variables*)

To capture the construct of strategic changes, we use the firms' strategic resource allocation profile (SRAP) as developed by Finkelstein and Hambrick (1990), which is composed of multiple dimensions of the firm's decision pattern. The original SRAP included six ratios.<sup>17</sup> If these SRAP ratios change over time, this indicates the occurrence of strategic change within a company (Carpenter, 2000) and reflects the historical pattern of a firm's activities. However, for these six ratios, many firms, particularly those in Europe, did not normally report information about their R&D, advertising intensity, or inventory level. To overcome the missing data problems due to this lack of reporting, we adopted a method recommended by Haynes and Hillman (2010). We used three ratios, specifically, plant and equipment upgrades, SGA overhead, and financial leverage, to describe the concept of strategic change.<sup>18</sup> Strategic variation is to represent the changes in the strategy. We calculated it using a combination of exponential smoothing and Euclidean distance measures. Exponential smoothing allows us to place more significance on the more recent observations, whilst also incorporating information gained from previous years (Wooldridge, 2009). We chose a four-year window of historical resource allocation figures to establish the pattern of variation within each firm, since it is long enough to capture strategic change, yet brief enough to exclude changes in the external environment that could not be incorporated into the study (Haynes and Hillman, 2010).

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<sup>17</sup> 1) The advertising expenses/sales ratio; 2) the research and development (R&D) expenses/sales ratio; 3) the net plant and equipment/gross plant and equipment ratio; 4) the selling, general, and administrative (SGA) expenses/sales ratio; 5) the working capital management and production cycle (inventory/sales) ratio; and 6) the financial leverage (debt/equity) ratio.

<sup>18</sup> To evaluate the reliability of our three-ratio approach, we also examined the results obtained using 4 ratios (the three above ratios plus a supplementary one) and 5 ratios (plus two supplementary ones) when we found the results obtained in all cases to be similar and equally robust).

Using time series data, I examined the four-year historical pattern of change in each of the three SRAP ratios to predict their respective value in the 5th year; that is, ratios in T-3, T-2, T-1 and T were used to forecast the predicted value in T+1; and the differences between actual figure and the predicted value in T+1 are the strategic variations to describe the changes of the resource allocation pattern. After applying the exponential smoothing technique to each of three resource allocation ratios, we summed the absolute value in percentages of difference between actual figures and predicted figures to gain a composited strategic variation measure. The summed difference is the dependent variable, strategic changes (variation) of each year.

#### *4.4.2.2. Focal constructs (independent variables generated from the CATA)*

CEOs' letters and statements filed in annual reports provided the raw data for our three key variables, specifically, future focused attention (FFA), negative emotion (NE), and commitment to change (C2C). We relied on two methods to extract the data variables. To extract the variables to examine FFA and NE, we used the predefined psycholinguistic program LIWC (language inquiry word count) (Pennebaker et al., 2007) To extract the variables to examine C2C, we developed a C2C dictionary, a list of words reflecting an intention to change strategy, based on a similar approach recommended by McClelland (2010).

LIWC has been demonstrated to be a valid and reliable tool for measuring individuals' psychological characteristics and states in the language disclosure process (Pennebaker and Francis, 1996). LIWC has been validated by having human evaluators rate the emotion and cognition content of thousands of texts (Pennebaker and King, 1999). Even given the use of irony, sarcasm and unusual sentence structure in company texts,

LIWC is still a useful tool for gauging the emotional state, intention, and cognition of the writers.

#### *Measuring new CEOs' FFA*

Future focused attention is measured using the future tense category dictionary in the LIWC which includes 48 words such as will, might, shall, and 'gonna'. For each letter or statement, it reports the amount of CEO attention devoted to events and what has yet to occur (Yadav et al., 2007).

#### *Measuring new CEO's NE*

LIWC's built-in negative emotion dictionary comprises 345 words (including, for example, hate, worthless, enemy, fear, anger and sadness) that reflect the intensity of the new CEOs' negative feelings and emotions. When Tausczik and Pennebaker (2010) analyzed the results generated by LIWC from text materials (.txt computer file), they found it produced negative emotion scores that reliably reflected the intensity of the authors' negative emotions in each letter from each year.

#### *Measuring new CEOs' C2C*

We measured new CEOs' commitment to change by analyzing the content of new CEOs' shareholder letters in the 3 years after their succession. Content analysis is a useful method for identifying specific characteristics within texts from which to draw valid inferences. The fundamental assumption of content analysis is language's ability to reflect peoples' cognition, attitude, belief and intention (Harwood and Garry, 2003, Duriau et al., 2007). We used a quantitative approach that computed the frequency of "change related" keyword counts in CEO shareholder letters. The frequency of particular words indicates

the importance and centrality of the underlying construct they represent. Following a two-stage procedure recommended by McClelland (2010) to measure CEO commitment to the status quo, we developed a commitment to change (C2C) dictionary. Words in the C2C dictionary were rated on a continuous scale from low to high, which showed the level of new CEOs' commitment/intention to implement changes in their company's strategy.

Development of the C2C dictionary involved two stages. A preliminary word list representing a high level of commitment to change was developed first because I expected that CEOs would like to communicate with shareholders and attempt to get their support for the changes in strategy. Two people coded the data and independently read through the CEO shareholder letters of 6 companies randomly selected from my sample; the two coders (coder ① and coder ②) were myself and an English native speaker, respectively. For each of the first three companies, coder ① read 3 letters written by the same new CEOs over a continuous three-year period, 9 letters in all. This approach enabled him to gain some insights not only into which words represent commitment to change, but also into the degree of commitment expressed in each letter, and the extent to which it fluctuated over this 3-year period. We had decided to focus particularly on verbs to do with motion because we found that they were often used when describing a change in strategy. After reading the 9 CEO letters, coder ① generated a list of the words frequently used to describe the changes. Coder ② then read another 9 letters from 3 other companies using the list of words developed by coder ①, and determined the extent to which those words were employed to describe changes in strategy. In this way, coder ② developed a list of new words which had not been selected by coder ①. Then, based on the two word lists, an open discussions between the two coders helped them to reach a preliminary

consensus, and full agreement was reached only after more letters had been confirmed to have used the same words to express commitment to change.

The second stage involved running some tests to evaluate this beta version of the C2C dictionary developed in the stage 1. For this test, we took some CEO letters that were not in this study for such a test. The results were brainstormed by a group of students that included some whose first language was not English, which helped the researchers further refine the C2C dictionary. The improved version of the C2C dictionary included verbs such as change, create, initiate, modify, innovate, transform, and experiment. Using word-stems in the C2C dictionary, the entire raw data-set was analyzed using the text searching program. This enabled us to capture all instances of the character strings representing the dictionary words in their various forms. For example, words such as “changes”, “change”, “changed” and “changing” were all taken into account. Eventually, the percentage of words in each CEO shareholder letter using C2C words can be used to describe the level of the new CEOs’ C2C in a specific year.

#### *4.4.2.3. Control variables*

For the firm’s characteristics, as discussed in the theory and hypothesis sections, poor prior performance may result in a change in strategy by the new CEOs. Therefore, to control for this factor, we used return on assets (ROA). We also controlled for size of firm because we expect that bigger firms will have a greater inertia towards changes in strategy. It is more difficult for a big firm to change its strategies. We used the logarithm of employee number to represent firm size. We controlled for the available slack resource of the firm for new CEOs, measured as the current ratio  $[(\text{current assets} - \text{inventory}) / \text{current liabilities}]$ . This is commonly used to evaluate corporate financial conditions (Stickney

and Brown, 1999). The more available slack resources give new CEOs some flexibility to play around as such strategic changes will be more common for the firms.

For external factors, the rapidity of environmental changes may also affect the uncertainty and the need for changes perceived by CEOs (West and Meyer, 1997). We considered the effects of dynamic environments by controlling for the instability of the industry conditions each year (calculated as the annual growth rate of industry total sales) (Westphal and Fredrickson, 2001). We also controlled the year effects by using dummy variables.

For management characteristics, we controlled for some of the important factors that influence the capability of new CEOs to make the changes happen. New CEOs sit on the top of the organizations; therefore, they have the official position of power. We controlled for the size of BoDs, i.e. the total number of directors (Zajac and Westphal, 1996), as an important corporate governance factor that we expect will influence the way in which new CEOs play their role. To measure new CEOs' power, as recommended by Haynes and Hillman (2010), we used a proxy, the proportion of CEOs' equity ownership within that of the whole BoDs. It reflects the importance of a new CEO and the control he/she has compared to other board members. We expect that the more power a new CEO has, the more likely that he/she will be able to generate strategic changes for the company. We also included other characteristics indicative of a new CEOs' power such as the new CEOs' age. We expected that it would positively correlate to strategic changes.

To represent the causality, we chose to use the one year forward value of strategic variation as the dependent variable (*F.Strategic change*) in the model. Equivalently,



strategic changes will be predicted by the values of all the independent and controlled variables one year before.

#### 4.5. Data analysis

To test our hypotheses better, we applied fixed effects models to analyze the longitudinal data. Fixed effect (FE) models can help us control for all possible characteristics of an individual even without measuring them as long as the characteristics do not change over time (time-invariant). Unlike the approaches used in other studies (Kaplan, 2008, Eggers and Kaplan, 2009, Yadav et al., 2007), (Antonakis et al., 2010), FE models are very useful because in the context of post-succession strategic changes, we followed the same new CEOs rather than different CEOs through their post-succession .142; (2) FFA is .164; (3) NE is .169; (4) C2C is .158; and (5) full is .226. The difference of  $\frac{R^2 - R^2_w}{2}$  between the final full model and the identical new CEOs.

When studying panel data, an FE model has better estimation to explain and predict complicated human behaviors correctly; it allows researchers to be more confident about their causality claims (Vandenberg, 2002, Cameron, 2005, Hsiao, 2003). FE models help us solve out the endogeneity problem generated from the unobserved heterogeneity. FE models assume that regressors are correlated with their individual effect. It decomposes the error term and eliminates the individual effect, thus making the regressors exogenous again. The attraction of the FE model is the consistent estimation of parameters, assuming that the unobserved heterogeneity is additive, even if the regressors are endogenous (Cameron and Trivedi, 2009, Cameron, 2005).

Rather than placing undue emphasis on cognition alone, the main purpose of this study was to examine the importance of the largely neglected psychological elements of emotion and intention in explaining PSSC. By appropriately controlling for other earlier-

recognized important factors, an FE model can help us jointly investigate variables from different theoretical viewpoints (Tuggle et al., 2010). Due to there being some missing values for some variables (because some of the information held by some companies is not publicly available), we are only able to include 268 firm year observations in the final fixed effects model.

Table 4.6: Description and correlation matrix for key variables

	Mean	Std.Dev.	1	2	3	4	5	6	7	8	9	10
1.F.Strategic change	4.004	1.067	1									
2.ROA	5.223	11.95	-0.19*	1								
3.Slack resource	148.1	173.1	0.03	-0.14*	1							
4.Environmental Dynamic	14.66	97.70	0.03	-0.11	0.20*	1						
5.Firm size	8.567	1.578	-0.33*	0.23*	-0.23*	-0.07	1					
6.BoD size	3.858	1.500	-0.08	0.00	0.03	0.05	0.25*	1				
7.Ownership	54.88	20.93	0.21*	-0.10	0.01	0.00	-0.17*	-0.38*	1			
8.CEO age	49.16	5.796	-0.15*	0.14*	-0.05	0.02	0.32*	0.13*	-0.12*	1		
9.FFA	0.633	0.381	0.06*	-0.24*	0.00	0.22*	0.03	0.11	0.01	0.03	1	
10. NE	0.931	0.417	-0.16*	0.00	0.04	0.03	0.10	0.01	-0.06	0.02	-0.12*	1
11.C2C	0.368	0.263	0.15*	0.04	-0.09	0.04	0.13*	0.11	0.08	0.13*	0.09	-0.13*

Notes: N=268; Significance level: \* p < 0.05

Table 4.6 reports the means, standard deviations and the pairwise correlation matrix of all observed variables in the final FE model. After a CEO succession, the strategic change one year forward, which we refer to as strategic change one year forward (*F.Strategic change*), correlated positively and significantly with FFA, C2C, CEO ownership, and with some of our control variables. *F.strategic change* correlated negatively and significantly with NE, firm performance (ROA), firm size, and the new CEO’s age. No serious multicollinearity problem has been detected so far since no correlation coefficient of two or more predictors was greater than 0.4.

**Analytical approaches**

Because the data for our focal constructs extend over three years, and we can use panel data analysis for the hypothesis testing, a few reasons drove us to select the fixed effects method. First, the observations were purposefully selected for this study and were not gleaned from a random sampling from a given population (Dougherty, 2007). We ran a Hausman test, which produced a significant result, thus indicating the appropriateness of

the FE model (Chi-squared test: p-value =.01) (Cameron, 2005). Moreover, an FE model lessens our concerns about the autocorrelations and heteroskedasticity of the firm, and about the heterogeneities of new CEOs and years as well (Greene, 2003).

In an FE model, the within-group estimator removes the fixed effects coming both from firms and the same new CEOs. It also removes the correlations between independent variables and fixed effects. We explain how our independent variables influence the PSSC using the following equation:

$$Y_{it} = \alpha + X'_{it}\beta + ((u_{i_{firm}} + u_{i_{newCEOs}}) + v_{it})$$

$Y_{it}$  is the predicted strategic change,  $X'_{it}$  are those independent and control variables. The individual effects are both from the firms and from the new CEOs; the component  $(u_{i_{firm}} + u_{i_{newCEOs}})$  can only be removed if the observations are gathered from the same new CEOs in the same firms over the years. Therefore, the CEO succession context provides a unique opportunity to do this. A time-invariant characteristic cannot cause strategic changes because it is constant for each new CEO in each firm over the years. Given these conditions, we can now make the effects of the psychological states of new CEOs, as variables that change over time (time-variant variables) stand out from other unobserved and unmeasured factors.

Table 4.7: Fixed effects models of PSSC

F.Strategic change	(1)	(2)	(3)	(4)	(5)
ROA	-0.019** [0.007]	-0.014* [0.007]	-0.019** [0.006]	-0.018** [0.006]	-0.011 [0.007]
Slack resource	-0.003 [0.002]	-0.003 [0.002]	-0.002 [0.002]	-0.003+ [0.002]	-0.003 [0.002]
Environmental Dynamic	0.000 [0.001]	-0.000 [0.001]	0.000 [0.001]	0.000 [0.001]	-0.000 [0.001]
Firm size	-1.200** [0.439]	-1.233** [0.442]	-1.048* [0.446]	-1.226** [0.444]	-1.291** [0.440]
BoD size	0.127 [0.081]	0.130 [0.081]	0.133 [0.082]	0.091 [0.082]	0.126 [0.081]
CEO ownership	0.003 [0.004]	0.005 [0.004]	0.004 [0.004]	0.003 [0.004]	0.005 [0.004]
CEO age	0.191+ [0.107]	0.254* [0.109]	0.212+ [0.108]	0.201+ [0.106]	0.276* [0.108]
FFA		0.417* [0.185]			0.477* [0.218]
NE			-0.433* [0.204]		-0.399* [0.199]
C2C				0.610* [0.306]	0.632* [0.312]
N	276	275	268	275	268
N in group	116.000	116.000	116.000	116.000	116.000
sigma_u	1.973	2.206	1.906	2.036	2.355
sigma_e	0.776	0.764	0.771	0.767	0.749
r2_w	0.142	0.164	0.169	0.158	0.226
rho	0.866	0.893	0.859	0.876	0.908
F	1.731	1.886	1.856	1.801	2.325
F_f	2.259	2.379	2.277	2.298	2.432

Notes: Standard errors in brackets + p<0.1, \* p<0.05, \*\* p<0.01; F tests for all  $\beta=0$  and F\_f tests for all  $u_i=0$ ; results are significant across all models; constants and dummies are not displayed.

Table 4.7 above reports the results of the FE models that predict PSSC strategic variation. We used fixed effects within-group estimators for the calculation. The structure was as follows: Model (1) is a baseline model which included only controlled variables both of the firms and of the new CEOs. Afterward, we investigated each element in the psychosocial trio individually. Models (2), (3) and (4) test the effects of independent variables with each of them being entered to the regression individually. Each of these three elements illustrates a distinct and significant influence on PSSC. Model (5) is the

final model and includes all the control variables and all the independent variables together; it demonstrates the overall effects of new CEOs' psychological states on strategic changes holistically. The F-tests in all models met the requirements to reject all fixed effects coefficients being jointly zero. The fixed effects were significant in all the models (numbers in parentheses show the standard errors of the variable coefficients).

Model (2) tested hypothesis 1; Model (3) tested hypothesis 2; and Model (4) tested hypothesis 3. Model (5) provided further supportive evidence for all three hypotheses above. The individual and combined influences of all three independent variables on strategic changes remained significant in the final model.

The rho  $\rho$  results show the importance of controlling for the fixed effects generated by the same companies and the same new CEOs. Time-invariant variables, including gender, ethnic background, elite educational affiliation, industry background, insider/outsider difference, previous job experience, among others, are unlikely to be changed if the new CEO remains in the post. We therefore believe that by following up the same CEOs over the years, a fixed effect approach can help us detect not only the fixed effects of the firms, but also the fixed effects generated by the same new CEOs.

Model (1) is a fixed effects model for firm-level and new CEO-level control variables. Apart from our focal constructs, his/her psychological states, the individual effects rho  $\rho$  makes up 86.5% of the variance in strategic changes in the baseline model, and  $\rho = 90.8\%$  of the variance in the final model (5). It made the effects of the psychological state of new CEOs clearer after considering both firm and new CEO fixed effects in the models.

For all of the models, the assumption that all unobserved firms' and new CEOs' characteristics would be equal was rejected (F-tests that all  $u_i = 0$ ); it indicates the obvious existence of fixed effects in all models. Because most of the variance in strategic change is explained by differences between firms and between new CEOs' characteristics rather than changes in the psychological states of new CEOs over time, failure to consider firm and new-CEO fixed effects would result in biased estimations of the effects of new CEOs' psychological states on strategic changes.

The results support hypothesis 1 that states "new CEOs' future-focused attention will influence the post-succession strategic change; an increase in FFA will increase the degree of strategic changes". As shown in both Model (2) and Model (5), new CEOs' FFA will increase strategic changes (unstandardized estimated fixed effect coefficients  $\beta = 0.417^*$  and  $0.477^*$ ); compared to the baseline Model (1) which included the controlled variables only, the addition of new CEOs' future focus in Model (2) improved the  $R^2_w$  for the strategic changes by 2.2%. Moreover, the fixed effects coefficients of new CEOs' FFA were both positive and significant, irrespective of whether they were examined individually, in Model (2), or considered together with other psychological elements holistically, in the final model (5).

The results support hypothesis 2 that states "negative emotions of new CEOs will negatively associate with the degree of PSSC: an increase in NE level will decrease the PSSC, and a decrease in NE level will increase the PSSC". As shown in Model (3) and Model (5), the increase in new CEOs' NE will decrease strategic changes ( $\beta = -0.433^*$  in Model (3), and  $\beta = -0.399^*$  in Model (5)). Compared to the baseline Model (1), the addition of the new CEOs' negative emotion in Model (3) increased  $\Delta R^2_w$  by 2.7%. Moreover, the fixed effects coefficients of new CEOs' negative emotions were both

negative and significant, irrespective of whether they were examined individually, in Model (2), or examined together with other psychological elements holistically, in the final model (5).

The results provided further supportive evidence for hypothesis 3 that states “an increase in a new CEO’s commitment to change will generate a greater degree of post-succession strategic change”. We expect that an increase in a new CEO’s level of C2C will result in a greater PSSC. As shown in Models (4) and (5), increases in new CEOs’ C2C increased strategic changes ( $\beta = 0.610^*$  in Model (4) and  $\beta = 0.632^*$  in Model (5)). Moreover, the addition of a further variable describing new CEOs’ C2C in Model (4) increased  $\Delta R^2_w$  by 1.6 % compared to the baseline Model (1). Moreover, the fixed effects coefficients of new CEOs’ C2C were both positive and significant irrespective of whether they were examined individually, in Model (2), or considered it together with other psychological elements holistically, in the final model (5).

When we included all three elements in the final model (5), all the effects of the above independent variables on PSSC remained significant in the same directions. In fact, the  $R_w^2$  obtained with the final model (5) was 22.6%, much greater than that obtained when they were only considered singly in Models (2), (3) and (4) (whose  $\Delta R^2_w$  values were 6.2%, 5.7% and 6.8%, respectively).. We believe that this final model was much better at explaining the PSSC when considering the three distinctive elements of a new CEO’s psychological state. It meets our original expectation that apart from emphasizing cognition, adding emotion and conation of the new CEO minds into the consideration will better explain the PSSC.



Interestingly, we also identified some additive interaction effects of these three distinct psychological factors from the analysis. A natural way to access interactions is to measure the extent to which the effect of the all the factors together exceeds the effect of each factor considered individually compared to the baseline (VanderWeele and Knol, 2012). The  $R_w^2$  of Model (1) baseline is .142; (2) FFA is .164; (3) NE is .169; (4) C2C is .158; and (5) full is .226. The difference of  $R_w^2$  between the final full models and three main effects individually is .019.<sup>19</sup> Thus, it discloses a potential positive interaction among these three factors.

Some of the control variables did not show significant effects on PSSC in any of the models, specifically the level of industrial dynamic, Board of Directors size, and the new CEO ownership ratio. We did, however, find some interesting patterns for certain control variables. For example, size of firm had significant negative correlations with strategic change, thus a good example of organizational inertia (Shimizu and Hitt, 2005). We could also see that the effects of the new CEOs' age, which was one of the proxies for the new CEOs' power, had a certain significant and positive impact on strategic change across the models.

As the hypothesis proposes, a firm's performance (ROA) has a negative impact on its strategic change in the future: when the performance of a firm increases, strategic changes will be reduced. ROA had negative and significant coefficients in all but the final model (5). When we took into account all three psychosocial elements simultaneously, the effects of prior performance disappeared. It is possible that the effects of ROA on strategic change were masked or evened out as a result of more psychological factors having been

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<sup>19</sup> the difference of  $R_w^2 = (.226 - .142) - ((.164 - .142) + (.169 - .142) + (.158 - .142)) = .019$

involved. These integrated elements from the new CEOs' psychological trio play a possible mediating role which might eliminate the direct effects of ROA on PSSC. Ultimately, the external signals such as ROA and other performance indicators need to be perceived, to be interpreted by the new CEOs, the commanders of strategic changes.

#### 4.6. Discussions & conclusions

##### 4.6.1. Theoretical implications

According to previous studies and theoretical arguments, external causes are expected to have significant influences on PSSC. Many researchers (Kaplan, 2011, Kaplan, 2008, Eggers and Kaplan, 2009, SEO and Barrett, 2007, Cho and Hambrick, 2006, McClelland, 2010, Baron, 2008, Krueger et al., 2000) look at top executives internally and assert that some elements, even a single psychological factor of leaders, can influence the strategies of their companies. I argue, however, that these claims are likely be incomplete on account of ignoring other important components in the human psychological trio. Only emphasizing the cognition of new CEOs will miss the bigger picture; investigating their psychological trilogy helps us understand the mechanism better behind PSSC ( $\Delta R^2_w$  is 6.2% between Model (2) and Model (5); the p-value in F test results for model fitness of Model (5) also became even more significant). Furthermore, this research provides some empirical evidence about the positive additive interaction among these three psychological factors. It contributes to our understanding of the trilogy-of-mind theory ((Hilgard, 1980) which overemphasizes the main effects of the human psychological factors.

##### 4.6.2. Methodological implications

In the case of non-experimental field studies, statistical problems arising from, for example, cross-sectional design, unobserved heterogeneity, common method single source bias, and omitted variable bias will produce many misleading results. In studying the

changes that follow CEO succession, following the same new CEOs over a period of time gave us a unique opportunity to remove both time-invariant characteristics of the new CEOs and firm-level individual effects from the analysis/model. So far, few studies in the prior literature have successfully developed such an approach.

This study makes some useful enhancements by using a panel data analysis of psychological states and tracing the same new CEOs after succession in a non-experiment field study. Unmeasured differences both in the attributes of the firms and in the new CEOs will influence the degree of strategic changes. In a CEO succession context, panel data can be used to overcome not only the methodological problems generated by unobserved heterogeneity about the characteristics of the firms, but also the unobserved heterogeneity about those time-invariant new CEO characteristics. Using exponential smoothing technique can help us better gauge the changes, depending on historical trend and the actual factors. Strategic changes have been better measured using this method rather than using the moving to average approach that many researchers adopted.

#### 4.6.3. Limitations of this study and future work

As we know, a long T (times of the observations) in panel data can help us to achieve better results. However, long T data are very difficult to obtain. Therefore, we need to select an appropriate timeframe for the observations. We need to make some tradeoffs to reach the balance between data availability and mathematical fineness. For future studies, we might be able to narrow down the unit of time; we can collect quarterly data rather than annual data about CEOs from company internal materials such as minutes of meetings, CEOs' speeches, conference calls, information from press releases and the media. By so doing, we can detect the nuances of the new CEOs' psychological changes and the strategic changes using different lenses. Comparing figures through the lenses of

metaphorical telescopes and microscopes will be very interesting. This study provides evidence that explains the importance of intra-individual (time-varying) psychological differences in the PSSC mechanism. Another potential interesting direction is to investigate the possible mediation roles of new CEOs' psychology in strategic management using other longitudinal analytic approaches. Due to the external validity challenges, the results and findings in our studies might not be apply in other geographic territories, for example, the Far East and the Middle East. Further studies in different countries will be necessary to improve the generalization of our findings.

## **Chapter 5. Essay Three: The degree of analysis (DoA) of new CEOs' cognitive reasoning and firms' cash holding**

### **ABSTRACT:**

Based on the cognitive continuum theory (CCT), this research advocates that new CEOs' cognitive reasoning and provides new explanations for the mechanism behind the cash holding phenomenon. It is down to CEOs to appreciate the needs and the associated risks. This study examines the relationship between the degree of analysis (DoA) in new CEOs' cognitive continuum and the cash holding policies; it suggests that DoA will increase firms' cash holding level because DoA tends to raise the calculated transaction costs, the management controls, the uncertainty avoidance behaviors and the opportunity costs. Using a psycholinguistic approach and computer-aided text analysis (CATA) technique, the empirical results of this longitudinal study support these claims for non-financial and non-utility firms in the FTSE All-Share Index.

## 5.1. Introduction

“Cash is king” is an age-old saying that stresses the importance of cash for the overall fiscal health of an organization. Companies are holding ever more cash than they used to, and cash holding is becoming a popular tendency. For example, Bates et al. (2009) found that the average cash to assets ratio of US firms increased from 10.5% in 1980 to 23.2% in 2006. In Europe 2012, the 1,000 biggest non-financial firms held over \$1.36 trillion in cash and cash equivalents (Patnaude, 2013). Cash hoarding is a notorious phenomenon among western companies (Jackson, 2013); these cash-rich firms could not contribute to the economic recovery because they were unwilling to spend money; they will eventually put themselves in the position of competitive disadvantage because of the lack of product innovation, manufacturing efficiency and technology (Gara, 2012).

To find a proper level of cash holding will be of interest to shareholders who always look at their pockets. Executives who are worried about cash act quickly to close factories and stores, lay off employees, postpone capital spending, and to abort research and development (R&D). As such, cash holding has crucial implications for other strategic issues. It is very important for a CEO to judge the optimal level of the cash holding of his/her firm and adjust it accordingly. Without enough cash on hand, companies can run into major trouble, and even be forced into bankruptcy. However, carrying excess cash could reduce shareholders' wealth because cash is not immediately invested in operations; it cannot earn returns to meet the firm's capital costs (Jensen et al., 1999). It is all about the tradeoff and the right balance.

The widely accepted assumption is that the main factor behind cash holding is economic uncertainty. Hence, scholars look for external factors such as environmental instability and pressure from shareholders to explain the phenomenon. However, the ways

in which information is processed are vital for making good decisions (Hwang and Lin, 1999). It depends on how the leaders as the decision-makers appreciate the need for and risks attached to a given cash level.

We intend to contribute to the behavioral finance literature by taking into account the decision-makers' cognitive reasoning. This research discusses a promising remedy for cash hoarding, by suggesting that CEOs should reduce the degree of analysis (DoA) in their cognitive reasoning and think more intuitively.

Leadership succession is a risky process (Giambatista et al., 2005, Rowe and Cannella, 2005). Under this uncertain circumstance with many challenges, it will be particularly interesting to know how new CEOs manage firms' cash holding levels. We attempt to use the cognitive continuum theory (CCT) (Hammond, 1996; Doherty and Kurz, 1996) to investigate whether or not and how the dynamic of DoA throughout CEOs' tenure influence their firms' corporate cash level.

## 5.2. Theoretical Background: the cash holding motives

Holding cash comes with a certain amount of cost. The concerns of the balance between the costs and benefits of cash holding are the foundations of the tradeoff theory (Opler et al., 1999). Generally speaking, there are three motives that create the tradeoffs, i.e. transaction cost motives (saving transaction costs to raise funds), precautionary motives (preparing for future uncertainty) and agency motives (managers' self-interests preferences to reduce their own risks).

### 5.2.1. Transaction motives

External finances are all subject to considerable transaction costs such as marketing campaigns, brokerage costs, and underwriting fees (Baumol, 1952, Miller and Orr, 1966). Therefore, firms prefer holding onto a certain amount of cash to cover the

costs of cash shortages. Moreover, the higher these transaction costs are, the greater will be the amount of cash firms will hold onto. Empirical studies show that the transaction costs for bigger companies to raise cash are lower; bigger economies of scale and less information asymmetry help them to keep a relatively smaller cash reserve than smaller firms (Mulligan, 1997).

#### 5.2.2. Precautionary motives

Another reason for cash holdings is the precautionary motive. Unlike transaction motives, in which “transactions have to be foreseen and occur in a steady stream” (Baumol, 1952), p.545), precautionary motives emphasize the potential impacts arising from the sudden potential investment opportunities and risks. However, most empirical studies did not investigate precautionary motives directly, but instead looked at some proxies, including increased financial constraints (Opler et al., 1999), increased cash flow volatility (Almeida et al., 2005, Han and Qiu, 2007), and increased growth potentials (Chang and Noorbakhsh, 2009).

#### 5.2.3. Agency motives

CEOs and shareholders evaluate the pros and cons of cash holding differently because of their conflicting interests and standpoints. CEOs have more incentive to hold onto cash because it could reduce their own risks and gain them more control over their firms. Jensen (1986) produced a free cash flow theory to explain the motivations of managers (that is, CEOs) to hold onto cash for their personal compensation, benefit, and goals. A further reason that CEOs prefer to rely on internal funds is to avoid being monitored. Large free cash flows increase CEOs' power, but with large amounts of cash on hand, they could be tempted to make blind investments, and quite often bad ones which will damage the wealth of shareholders (Chang and Noorbakhsh, 2009).



**Apart from above three tradeoff factors**, we also have to consider the CEO's cognitive mind. The decision-makers are typical, bounded rational people (Pompian, 2012) whose various reasoning strategies can result in biased judgments and decisions for their companies. It is down to the CEOs to calculate and appraise the transaction costs of raising finance; CEOs depend on their thinking patterns to perceive future uncertainty, corporate governance and act upon their perception (Rindova, 1999). We suggest that CEOs' intuition and analysis are other important sources of tradeoffs for the cash holding.

### 5.3. Hypothesis development

The sections below will discuss: 1) the importance of CEOs' cognition for the cash holding policies; 2) the notion of analysis and intuition; 3) the cognitive continuum theory and quasi-rationality; 4) a hypothesized relationship between new CEOs' DoA and cash holding.

#### 5.3.1. CEOs and their cognition for firms' financial decisions and cash holding policies

Why do CEOs, and not others matter to the important financial decisions? Malmendier et al. (2011) found that CEOs directly determine financing strategies for their firms, and that even when Chief Financial Officers (CFOs) help to determine them, their decisions positively correlate with the CEOs' traits. Graham et al. (2011) have shown that CFOs mainly execute orders and implement strategies set by CEOs. Furthermore, CEOs can turn down or approve a stock offering at the last moment, or overrule their CFOs. Hence, CEOs will almost certainly have the ultimate say. It is therefore valid and reasonable to focus on the effects of CEOs' thoughts on firms' cash holding policies. For instance, Franck Riboud, CEO of Danone, set the target to an increase of 10% in cash holdings in 2010 (Danone Annual Report, 2009). Jouko Karvinen, CEO of Stora Enso, attributed his company's success in dealing with the 2008 financial crisis to a strategic

focus on cash holding in the previous years (Lehtinen, 2011). Karvinen and his top management team had effectively managed the working capital to reduce expenditure and minimize operational costs. Norbert Reithofer, CEO of BMW, commented that due to the uncertain conditions on international capital markets, they increased their cash levels at the beginning of 2009 (BMW Annual Report, 2009). Reithofer clearly expressed his precautionary motivations in taking cash as a useful tool for dealing with the upcoming difficulties. To make sure their firms have enough but not excessive money for future investments, cash holding is a primary decision for the CEOs (Lins et al., 2010), (Campello et al., 2010).

For the purposes of examining cash holding policy, previous studies have mainly focused on the level of CEO ownership, the effects of descendant and founder CEOs, and the differences between insider and outsider CEOs (Faulkender, 2002, Niskanen and Steijvers, 2011, Steijvers and Niskanen, 2012). However, the need for cash has to be evaluated and decided by CEOs. In the CEO succession period, the new CEOs can exercise a high level of discretion (Orens and Reheul, 2013) and, therefore, they will have a substantial influence on their firms' cash holding policies.

### 5.3.2. Reasoning

#### 5.3.2.1. Cognitive reasoning

Reasoning is the “workshop” of one’s mind, and it works as the “control panel” for signals from the interior which provide the potential guidance for judgment and decision-making (Hodgkinson et al., 2009). An individual’s ability to reason things through is vital because it governs the rest of his or her qualities (Woiceshyn, 2009), for example, the individual’s ability to speak and to design something, or to manage a business. Generally

speaking, there are two types of reasoning, namely, analytic/rational reasoning and intuitive/experiential reasoning (Taggart and Valenzi, 1990), (Epstein et al., 1996).

Kahneman defined intuitive reasoning as thoughts and preferences that come to mind quickly and with little reflection ((Kahneman, 2002), p.449). Analytical reasoning is a “step by step, conscious, logically defensible process” (Hammond, 1996), p.60). Intuition and analysis are fundamental bridging constructs in behavioral science (Hodgkinson et al., 2008). The single superordinate dimension of cognition that underpins numerous facets of information processing is the intuition-analysis continuum, i.e. the magnitude of DoA

(Allinson et al., 2000, Dhami and Thomson, 2013). For this research, we will take on this dimension; we define cognitive reasoning as the general judgment guidance with different DoA (from low to high) that managers adopt for company decision-making.

#### *5.3.2.2. Intuition VS Analysis: Which one is better?*

Analysis and intuition will influence the decision outcomes, including their consistency, error distribution, response rate, self-insight to policy, confidence level (Dunwoody et al., 2000), decision disturbances (Elbanna et al., 2013) and organizational performance (Khatri and Ng, 2000).

An improvement in judgment does not necessarily demand a greater use of analysis (using all relevant and available information), but rather requires the appropriate use of the most predictively valid pieces of information (Gigerenzer et al., 1999); actually, the way in which information is processed is vital for making good decisions (Hwang and Lin, (1999). Analysis increases the comprehensiveness of a strategic decision. However, this comprehensiveness does not necessarily increase the quality of the decision. For example, Souitaris and Maestro (2010) found that the comprehensiveness of decisions

harms the performance of high-tech firms. Comprehensiveness only has a positive effect on the quality of a decision when the quantity and determinacy of information are both high (Miller, 2008, Dhimi and Thomson, 2013). Thus, for the new CEOs facing uncertainty, being completely rational and relying on analysis may not produce the best cash holding decision.

#### 5.3.3. Dichotomy vs. continuum.

Researchers mainly adopt either a dichotomy or a continuum view to study analysis and intuition. Dual process theories suggest that there are two separate cognitive systems (Chaiken and Trope, 1999, Epstein, 2003, Sloman, 1996, Gilovich et al., 2002). System 1 is an automatic, associative, holistic, and fast-working process that requires little cognitive effort and which is acquired through evolution, development and experience. System 2 is a slow, control, rule-based, and analytical process learned through formal training. Most dual process theories adopt an either-or (conflicted) approach. Some researchers argue that there is a switch mechanism in managers' brains whereby one mode of cognition takes precedence over the other (Huang and Souitaris, 2009), and that people are free to switch between two parallel systems. However, neither analysis nor intuition can be easily employed (Hammond, 1996). Pure analysis can only be employed by those trained in it.

Cognitive continuum theory (Doherty and Kurz, 1996, Hammond, 1996) provides an alternative view by recognizing modes of cognition that lie between analysis and the intuition continuum. Dhimi and Thomson (2013) advocate that a quasi-rationality is an important explanatory variable in understanding how managers make up their minds and make decisions.<sup>20</sup> A quasi-rationality is cognitive reasoning with an appropriate DoA

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<sup>20</sup> For a detailed summarized description of CCT and its inherent properties, please refer to Appendix 2.

which helps managers achieve a good enough decision with low analytic costs (Simon, 1987).

There are many uncertainties, time pressures, risks, as well as resource scarcity and anxiety for the new CEOs. On the one hand, the new CEOs need to be able to analyze problems systematically; on the other hand, he/she also needs to be able to respond to situations rapidly. Therefore, quasi-rationality with a proper DoA is very useful. CEO succession provides us a unique opportunity to study firms' strategies under the administration of the same CEOs longitudinally. We propose that the dynamic DoA during CEOs' tenure generates the variants of firms' cash holding policies.

#### 5.3.4. Hypothesized relationships: Cognitive reasoning in financial decisions

Financial decision-making has been typically deemed as an analytical and rationale driven topic (Tronnberg and Hemlin, 2013). However, more and more researchers have identified the important role of intuition in financial decision-making (Hensman and Sadler-Smith, 2011). For example, some credit decision interviews (Lipshitz and Shulimovitz, 2007) found when rating the credibility of loan applicants, loan officers integrated "hard" financial data with "soft" data such as impressions and gut feelings; they treated feelings as more valid indicators of applicants' credit worthiness than financial figures (they are more keen to use impression information and give more credit to it). They even claimed that relying on intuition with a low DoA in cognitive reasoning may lead to better evaluation results and get more creditworthiness than deliberation decisions.

Information such as impressions, relationships with clients as well as other information not found in the financial records cannot be quantified easily (Boot, 2000). In this research, we propose that the DoA will influence cash holding due to the mechanism in the following arguments.

#### *5.3.4.1. DoA and the calculation of transaction costs*

The DoA is associated with the amount of cognitive effort and intention involved in reasoning (Hogarth, 2001, Hogarth, 2010, Epstein et al., 1996, Myers, 2004). These differences in intentional cognitive effort will lead to the variant in estimated results.

A high amount of cognitive effort increases people's cognitive complexity and they will use multiple perspectives when they perceive and evaluate stimuli (Goodwin and Ziegler, 1998). A high DoA will favor the use of numerical and verbal data compared to a low DoA which has a preference for qualitative and vivid pictorial data (Dunwoody et al., 2000, Doherty and Kurz, 1996, Dhimi and Thomson, 2013). Therefore, with a high DoA, CEOs tend to use numerical and quantitative methods to calculate the transaction costs of raising funds; they will involve a more complex encoding in their memory systems (Hammond, 1996). By considering more factors into the thinking processes, the DoA will increase CEOs' evaluation complexity and expected cash holding level.

With a high DoA, new CEOs will try hard to gain information and knowledge about the organizations and environments in which the firms operate (Richard et al., 2009). These will explicitly and implicitly raise the estimated transaction costs of getting funds and will make firms retain more cash on hand.

#### *5.3.4.2. DoA and management control*

A high DoA will lead to a high level of conscious control and a slow speed of processing because information sources are consciously integrated into a judgment via a specific policy (Dunwoody et al., 2000). Analysis supports the planning and control processes (Herath, 2007). Control is a very important management function guiding the attainment of a preconceived goal or objective. A very important property of analysis is the need for confidence in judgment (Doherty and Kurz, 1996, Epstein et al., 1996).

Boosting their confidence level, new CEOs implement control over their firms via increasing their firms' cash holding level.

A high DoA will use consistent information rules. It will use the same information categories and policies in the same way with each judgment. Therefore, the reliability of decision and decision consistency are high (Dunwoody et al., 2000, Doherty and Kurz, 1996, Hammond, 1988, Hammond, 1996). These feelings of decision reliability will enhance decision-makers' confidence and feeling of control. The psychology literature suggests that executives are particularly prone to exhibit self-attribution and illusions of control (Malmendier et al., 2011). Huang et al. (2011) found that CEOs who want stronger control over their firms will hold more cash than others. They may reserve cash for activities such as buying back shares and hunting for large investment opportunities (Huang et al., 2011). Therefore, we believe that the DoA in CEOs' cognitive continuum will increase firms' cash holding level.

#### *5.3.4.3. DoA and uncertainty avoidance*

The cash holding of a firm is positively correlated with the degree of uncertainty avoidance (Ramirez and Tadesse, 2007). Those uncertainty avoidance companies will hold more cash (Chang and Noorbakhsh, 2009), (Chen et al., 2013). Malmendier et al. ((Malmendier et al., 2011) found that CEOs' early-life experiences, for example, growing up during the Great Depression and graduating during a recession will make them more averse towards uncertainty. Uncertainty avoidance is one of the key reasons for holding cash, even for those financially unconstrained companies (Dittmar and Duchin, 2013); for example, CEOs' previous employment experience in financially difficult firms will make their cash to assets ratio 3.1-4.4% higher.

A high DoA is associated with uncertainty avoidance because the information is processed under consistent procedures and guidelines (Hammond, 1996, Dunwoody et al., 2000, Doherty and Kurz, 1996). In contrast, a low DoA will reduce people's perception of risk and increase their risk taking behavior (Bohm and Brun, 2008). Therefore we expect that the high DoA will increase firms' cash holding level.

New CEOs with a high DoA will think hard and have longer time perspectives. In contrast, with a low DoA, CEOs are less likely to do explicit planning and prefer to make last minute decisions. Chang and Noorbakhsh (2009) found that the long-term orientation will value the commitment of social and business relationships, which encourages patience, thrift and self-reliance. We expect that a high DoA will make CEOs more alert. For those companies which tend to offer long-term job security to employees (Newman and Nollen, 1996), CEOs will maintain larger balances of cash to support it.

With a high DoA, CEOs will have broader coverage of the topic and be more prudent (Bartunek et al., 1983). We expect that with a high DoA, CEOs attach more value to the precautionary and flexible role of cash and grant less value to the opportunity costs of cash. Firms run by conservative CEOs are more likely to be cash-rich (Dittmar and Duchin, 2012). The higher the DoA, the more risk averse and conservative the CEOs will be (Baker and Wurgler, 2002). Risk-averse CEOs prefer internal funding over external funding. A high DoA will make CEOs hold a high level of cash to hedge against future, undesirable events.

#### *5.3.4.4. (Low) DoA, knowledge and opportunity costs.*

According to Epstein (2003), intuition, a low level of DoA, is associated with experience and knowledge, or a combination of both based on previous similar situations (Hensman and Sadler-Smith, 2011, Epstein et al., 1996). By looking at the first year after



turnover, Custodio and Metzger (2012) found that new CEOs with financial experiences decrease their cash levels; they have a higher propensity to pay dividends and repurchase shares. Financial experts have better access to capital markets (Guner et al., 2008). Sophisticated CEOs manage financial policies more actively, communicating better with financial markets; therefore, we can assume that with a low DoA, intuition will bring down the cash holding needs of their firms.

A low DoA is associated with high speed information processing and low cognitive burden (Doherty and Kurz, 1996, Dhimi and Thomson, 2013). Faster information processing and a shorter response time will bring competitive advantages to the firms; a quick decision also reduces the opportunity cost of time. Moreover, a low DoA, i.e. effortless intuition, will also reduce the calculation costs (Forbes, 2007) of cash holding decisions. In all, a low DoA will reduce firms' cash holding.

To sum up, the DoA will influence the calculation patterns, increase the evaluation complexity and estimated transaction costs. A high DoA is correlated with uncertainty avoidance activities. A high DoA is more likely to generate the need for confidence in judgment and enhance CEOs' cash holding decisions to archive stronger management control. On the other hand, intuition, namely, a low DoA, is not just a "guess"; it is correlated with new CEOs' knowledge and experience which will bring down their firms' need for cash holding. An effortless low DoA also reduces the costs of the calculation involved, the response time, and the associated opportunity costs. Based on these arguments, a hypothesized relationship is developed as below:

***Hypothesis:*** *the DoA of new CEO cognitive reasoning will influence their firms' cash holding level. A high DoA will increase the firms' cash holding level; in contrast, a low DoA will decrease the cash holding level of the firms.*

#### 5.4. Research methods and measurements

To catch the dynamic of DoA during CEOs' tenure and develop stronger causal relationships, we adopted a longitudinal research design and collected panel data from the field. We selected the companies from the FTSE All-Share Index<sup>21</sup> based on the criteria below: 1) the CEO succession took place from 2002 to 2007; 2) non-financial and non-utility industrial firms only; 3) BoDs and CEOs' information were available; and 4) CEOs' shareholder letters were available in the next 3 continuous years after the succession. Because of the data availability of some key variables, the final dynamic model contains 382 observations. Within these observations, the average number of words in these CEO shareholder letters is 1956.

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<sup>21</sup> The top 600s companies in the FTSE (Financial Times and the London Stock Exchange).

Table 5.8: Summary of Constructs, Variables, Measurements Theoretical Assumptions and Data Sources

Constructs	Variables	Operationalization/Measurements	Theories & expected relationships	Sources		
1. Dependent variables: Cash holding level						
	Cash1	Cash and equivalents/total assets		Bloomberg T1B/DataStream		
	Cash2 (for robustness checks)	Cash and equivalents/( total assets - cash and equivalents)				
2. Control variables: important factors found in prior empirical studies						
Environmental characteristics	Environmental Dynamism	The rate of sales change for each industry each year	Transaction theory (+) Precautionary theory(+)	T1B Bloomberg		
	Time effects	year dummies				
Firm characteristics	Firm size	Ln (number of employees)	Transaction theory (-) Precautionary theory (-)	T1B Bloomberg		
	Firm growth trend	The change rate of annual sales for each firm	Transaction theory(-) Precautionary theory(+)			
	Cash flow	(IncomeBeforeExtraItemsAndPfdDiv + DepreciationDeplAmortExpense)/total assets	Transaction theory(+) Precautionary theory(-)			
	Quick ratio	(Current assets – inventory) /current liabilities	Transaction theory (+) Precautionary theory (-)			
	Leverage	Total debt / total assets	Transaction theory (-) Precautionary theory (-)			
	Debt maturity	STDebtAndCurPortLTDebt /total debt	Transaction theory (+) Precautionary theory (+)			
	Dividend ratio	Common Dividends/ total assets	Transaction theory (-) Precautionary theory (-)			
	Capital intensity	Total assets/sales	Transaction theory (+) Precautionary theory (+)			
	Corporate governance	CEO ownership	The percentage of new CEOs' equity ownership occupied in the whole BoDs		Agent theory (-)	Boardex Bloomberg
		Board size	Number of directors		Agent theory (-)	
3. explanatory variables : focal constructs (need to be tested in the CEO succession context)						
The degree of analysis in CEOs' Cognitive reasoning	DoA	Words related to cognition terms in a text. (the Diction 5.0 score)	Cognitive continuum theory (+)	CEO shareholder letters		

Notes: we categorize variables into three groups: the dependent variables, control variables and the explanatory variable. (-) represents an expected negative relationship and (+) represents an expected positive relationship between cash holding level and other variables from different theoretical perspectives.

Table 5.8. summarizes the constructs/variables that we plan to use for the hypotheses testing. It illustrates the operationalization of the measurements, theoretical assumptions, expected relationships and data sources.

#### 5.4.1. Dependent variable

**Cash holding level:** We use the two most popular measures: (1) CASH1 is the cash and equivalents in a specific year divided by the book value of total assets (Ozkan and Ozkan, 2004), (Levitas and McFadyen, 2009); (2) for the robustness checks, CASH2 is the ratio of cash and equivalents (i.e. cash and short term investments) to total assets less cash and marketable securities (Garcia-Teruel and Martínez-Solano, 2008, Opler et al., 1999).

#### 5.4.2. Control variables

Based on the three most important motives, i.e. transaction cost, precautionary and agency motives, we summarized important explanatory variables at three different levels.

##### 5.4.2.1. Environmental and external impacts

**Environmental dynamic:** We expect that environmental uncertainty will create information asymmetry which hampers firms in raising funding externally (Baum et al., 2006). Hence, it increases the level of corporate cash holding. We use the rate of sales change for each industry each year as a proxy for it.

**Year dummies:** We also expect that cash holding policies will be influenced by specific environmental factors in different years.

##### 5.4.2.2. Firms' characteristics

**Firm size:** Transaction cost researchers believe that bigger sized firms can more easily liquidate their assets (Bates et al., 2009). Economies of scale help firms (Mulligan, 1997), (Barclay and Smith, 1995) to reduce the costs of raising money. From a precautionary point of view (Rajan and Zingales, 1995), information about large firms will

be better available in the public domain which helps external fund providers make decisions easily. Less information asymmetry (Jordan et al., 1998), (Berger et al., 2001) and financial constraints (Whited, 1992) will make big firms less likely to suffer financial distress from cash shortages (Titman and Wessels, 1988) than small firms. Hence, we expect a negative relation between firm size and cash holding. The logarithm of employee number will be used to represent the size of the firms.

**Growth opportunities:** Growth opportunities are important reasons for firms to hold cash, (Opler et al., 1999), (Ferreira and Vilela, 2004, Ozkan and Ozkan, 2004). Managers do not want to be monitored externally by debt holders (Garcia-Teruel and Martínez-Solano, 2008). Hence, we expect a negative relationship between growth opportunities and cash holding. We use a way adopted by Garcia-Teruel and Martínez-Solano (2008) taking one year turnover change rate of the firm as a proxy for the growth potential.

**Cash flow ratio** (the ratio of cash flows to total assets): A large cash flow will keep firms at a high cash holding level (Opler et al., 1999, Ozkan and Ozkan, 2004). However, Kim et al. (1998) claim a negative relationship because cash flow is an additional source of substitute cash to fill the cash need. The relationships between cash flow ratio and cash holding are unclear from different literature and need attention in our research context. We use the ratio of cash flows to total assets representing the firms' cash flow generation capability.

**Quick ratio:** Quick ratio is an accounting measure commonly used to evaluate corporate financial health (Stickney and Brown, 1999). An ideal quick ratio is 1 or above and firms do not face immediate pressure of financial constraints. A high ratio shows the

viability of a firm (Laitinen, 1992) to meet its obligations. A healthy firm can generate cash return; therefore, we expect a positive relationship between quick ratio and cash level.

**Leverage:** In some empirical studies (Ozkan and Ozkan, 2004), (Opler et al., 1999, Ferreira and Vilela, 2004), researchers have found that leverage (debt to assets ratio) decreases the cash holding because the cost of funds used to invest in liquid assets rises as financial leverage increases (Baskin, 1987). John (1993) stressed that the ability to access the debt markets can resort to borrowing as a substitute for liquids assets. Thus, we expect a negative relationship between leverage and cash holding level.

**Debt maturity structure:** With a big proportion of short-term debt, firms have to negotiate the renewal of their credits periodically with high refinancing risks (Guney et al., 2007), (Ferreira and Vilela, 2004). Garcia-Teruel and Martínez-Solano (2008) advocate firms having a bigger proportion of short-term debt will keep high cash levels to avoid the financial distress and pay off their debt on time.

**Dividend ratio:** Bates et al. (2009) found that firms currently paying dividends are able to raise funds at a lower cost by reducing their dividend payments. From a precautionary point of view, dividend ratio is a positive signal to the public that firms can access to the capital market better. Thus, we assume a negative relationship between dividend ratio and cash holding level.

**Capital intensity ratio:** This ratio reflects a company's efficiency to manage its assets contributing to the revenue generated. The higher this ratio, the bigger the investment required to generate sales. We expect that capital intensity is positively related to cash holding because capital intensive firms need to hold more cash for the investment purposes. We use total assets to sales ratio for this measure.

#### 5.4.2.3. Corporate governance factors

**CEO ownership:** Interest conflicts between shareholders and managers are less likely to occur when managers own more company shares (Chen and Chuang, 2009, Faulkender, 2002). However, from an entrenchment view, greater ownership gives CEOs more direct controls over the firms to resist outside pressures (Ozkan and Ozkan, 2004) and hold more cash to pursue their own interests. The relationships between CEO ownership and cash holding are controversial in the field and need to be examined in our context. Here, we use the proportion CEO's equity share in the total equity share owned by the whole BoDs.

**Board size:** We suppose that board size will increase the monitor on CEOs' power; it will reduce the chances of CEOs' opportunism (Faulkender, 2002, Faulkender and Wang, 2006). Therefore, the number of board members will be negatively related to cash holding level.

**As discussed above,** these variables meet the Bono and McNamara (2011) criteria of the proper inclusion of control variables. They are expected to correlate with the independent and dependent variables owing to strong theoretical foundations, i.e. transaction costs, and precaution and agency motives.

#### 5.4.3. Explanatory variable

CEO letters/statements in annual reports serve as the raw data for our explanatory variable, the DoA in new CEOs' cognitive reasoning. We use mainstream computer-aided content analysis software DICTION 5.0 (Hart, 2000) to extract this variable.

Most researchers study the intuition-analysis dimension of cognitive reasoning by looking at the attribution of intuitive decision (Blume and Covin, 2011) or the preference of intuition (Allinson and Hayes, 1996). They mainly use self-report approaches such as surveys and interviews. Other methods such as "think aloud" (Hamm, 1988) and "verbal

protocol” (Ericsson and Simon, 1980) allow participants to verbalize their thoughts. However, these obtrusive methods face the problems of social desirability (Podsakoff et al., 2003, Kiesler and Drasgow, 1999) and retrospective bias (Miller et al., 1997) because subjects often respond to questions with what the researchers want to hear and the respondents might not be able to remember the correct answers. The purposeful “think aloud” method will hamper individuals in articulating their subconscious intuition (Huang and Souitaris, 2009). Therefore, we call for unobtrusive methods to overcome the above-mentioned drawbacks.

One of the pioneer studies using content analysis to measure the DoA is the Noel and Erskine (2013) study on students’ journals in an entrepreneurship simulation. To measure the individuals’ analytical orientation, the repeated use of cognition-related words in the written logs signifies an emphasis on analytical thinking. The CATA method can help us capture cognitive data “in the moment” as it reduces the problems of retrospective bias (Miller et al., 1997), social desirability (Spector, 2006, Fisher, 2000) and other difficulties inherited from obtrusive approaches (Webb and Weick, 1979).

**The DoA in CEO’s cognitive continuum:** In this research, we measure new CEOs’ reasoning using one of DICTION 5.0’s 35 built-in dictionaries, the “cognitive terms” (Short and Palmer, 2008, Hart, 2000). Words in this category represent cerebral processes (Hart, 2001); exemplary sub-categories and vocabulary include rationalistic (estimate, examine, reasonable) and calculative (diagnose, analyze, inference), modes of discovery (deliberate, compare, contrast ) and so on. The DICTION score here represents the DoA: the more frequently a CEO uses these terms in his/her shareholder letters, the higher the score of DoA he/she will have. In contrast, the lower the score he/she has, the lower the DoA of his/her reasoning. This method has the advantages of a stable coding



scheme, explicit coding rules, high reliability, ease of use and the ability to deal with large volumes of data at low cost (Morris, 1994).

## 5.5. Data analysis

### 5.5.1. Analytical procedures

We attempt to test our hypothesis for the cash holding using a dynamic panel data (DPD) analysis approach. Panel data analysis makes it possible to model dynamic processes with micro data (Bond, 2002). We assume that firms are pursuing a target cash level while making cash holding decisions (Garcia-Teruel and Martínez-Solano, 2008, Ozkan and Ozkan, 2004) and it is a partial adjustment process. The cash holding level achieved at any time will also be explained by the decisions taken in the prior periods. We follow the procedures adopted by previous empirical studies (Garcia-Teruel and Martínez-Solano, 2008, Ozkan and Ozkan, 2004); we believe that the optimal cash level  $CASH^*_{i,t}$  is given by the particular characteristics of a firm plus a random disturbance as:

$$CASH^*_{i,t} = \rho + \sum_k \beta_k x_{kt,t} + \zeta_i + \theta_t + v_{i,t} \quad (1)$$

Firms will adjust their cash holding levels to achieve this optimal level  $CASH^*_{i,t}$ .  $\zeta_i$  is the individual effects dummies, and  $\theta_t$  is the time effects dummies. As such, any changes occurring will be determined by:

$$CASH_{i,t} - CASH_{i,t-1} = \gamma(CASH^*_{i,t} - CASH_{i,t-1}) \quad (2)$$

$(CASH^*_{i,t} - CASH_{i,t-1})$  is the required adjustment to reach the optimal level;  $\gamma$ , the coefficient value is between 0 and 1. It represent a firm's capacity to achieve the desired level. If  $\gamma = 1$ , the firms are able to modify their cash levels to the optimal level immediately; if  $\gamma = 0$ , it means that the cost of adjustment is huge and firms are no longer able to adjust their existing cash levels. Substituting (1) for (2), the equation explaining the cash holding levels are transformed as:

$$CASH_{i,t} = \alpha + \delta_0 CASH_{i,t-1} + \sum_{k=1}^n \delta_k x_{k,i,t} + \eta_i + \lambda_t + \varepsilon_{i,t} \quad (3)$$

Here,  $\alpha = \rho\gamma$ ;  $\delta_0 = (1 - \gamma)$ ;  $\delta_k = \gamma\beta_k$ ;  $\eta_i = \gamma\zeta_i$ ;  $\lambda_t = \gamma\theta_t$ ;  $\varepsilon_{i,t} = \gamma v_{i,t}$

$\delta_0$  is 1 minus the adjustment coefficient  $\gamma$ . The variable  $\eta_i$  acts as the unobservable heterogeneity to measure the particular characteristics of each firm and each CEO, as well as the characteristics of the industry in which the company serves. The parameters  $\lambda_t$  are time dummy variables; this represents the same macro-environment impact on all the firms in each of the time periods. By considering these individual effects and time effects, we are able to capture the factors that firms cannot control and which may influence their cash decisions.

The lagged dependent variable, the cash holding level one year before, is an important explanatory variable in a DPD model.<sup>22</sup> Since the lagged dependent variable works as an explanatory variable, DPD analysis has to face the challenge of autocorrelation. Estimations in static modeling methods lose their consistency (Baltagi, 2008). Since  $CASH_{i,t-1}$  is correlated with  $\eta_i$ , even if  $\varepsilon_{i,t}$  is not serially correlated, these factors make the Ordinary least squares (OLS) estimation for equation (3) inconsistent. Using the intragroup estimators, variables in the equation (3) are transformed into deviations from the mean and are also inconsistent because of the correlation between  $(CASH_{i,t-1} - \overline{CASH}_{i,t-1})$  and  $\varepsilon_{i,t} - \overline{\varepsilon}_{i,t}$ . General method of moment (GMM) is better than OLS because OLS omits the historical trend of the variables (Greene, 2003). DPD analysis is suitable for a small “T” and bigger “N” situation (Roodman, 2009a). A DPD model is suitable for our study because it can internally generate some instruments; all variables (including lagged and differenced variables) in regressions are assumed not to correlate with error term.

<sup>22</sup> For more detail on the importance of the lagged dependent variable, please refer to Appendix 3

Bond and Windmeijer (2002) comment that difference GMM can overcome the problems of the endogeneity of independent variables and the heteroscedasticity of residuals. However, it can also lose some information, particularly with a small sample size. System GMM is better than difference GMM in situations where the series are close to being random walks (Baum, 2006). The forward orthogonal deviations transformation in system GMM performs better by introducing more instruments. System GMM brings into consideration a level equation: using lagged differenced variables as instruments for variables in level equation. System GMM has a much smaller finite sample bias and much greater precision when estimating autoregressive parameters using persistent series (Bond, 2002). We can use the first differenced variables as instruments for the equation in levels in a stacked system of equations that includes the equations in both levels and differences (Wintoki et al., 2012).

#### 5.5.2. Descriptive analysis (statistical description and univariate comparisons)

The number of directors on the board in the sampled firms ranges from 2 to 9 and the average is 3.97. These companies had 22,596 employees on average. Table 5.9 shows the means, standard deviations and the pairwise correlations among the variables for the observations based on the final dynamic model regression. The average cash to assets ratio (cash holding level) is 10.64% in the pooled data. As shown, cash holding level significantly correlated with the majority of explanatory variables. In accordance with the assumptions from prior studies and the developed hypothesis, cash holding level is significantly and positively correlated with quick ratio, short-term to total debt, dynamic of external environment and DoA. It significantly and negatively correlated with firm size, leverage, capital intensiveness and BoD size. No serious multicollinearity problem has been detected so far since no correlation of two or more predictors is greater than 0.4.

Table 5.9: Statistical description and correlation

Variables	Mean	Std.Dev.	Correlation											
			1	2	3	4	5	6	7	8	9	10	11	12
1.Cash1	10.64	10.12	1											
2.Firm size	8.762	1.541	<b>-0.14*</b>	1										
3.Growth trend	8.772	20.26	<b>-0.05</b>	0.08	1									
4.Cash flow	7.354	17.24	<b>-0.08</b>	0.15*	0.23*	1								
5.Leverage	23.30	16.09	<b>-0.24*</b>	0.22*	-0.01	0.08	1							
6.Quick ratio	1.001	0.706	<b>0.37*</b>	-0.21*	0.03	-0.04	-0.21*	1						
7.Dividend ratio	4.202	25.87	<b>-0.03</b>	0.05	-0.01	0.09	0.32*	-0.07	1					
8.Capital Intensive	105.6	70.22	<b>-0.10*</b>	-0.01	-0.04	-0.03	0.19*	0.19*	-0.01	1				
9.Short term To total debt	34.67	34.88	<b>0.30*</b>	-0.28*	-0.05	-0.11*	-0.37*	-0.07	-0.04	-0.24*	1			
10. CEO Ownership	53.67	21.12	<b>0.05</b>	-0.18*	-0.14*	-0.04	-0.02	0.03	-0.04	0.08	0.10*	1		
11. BoD size	3.966	1.499	<b>-0.10*</b>	0.23*	-0.07	0	0	-0.11*	0.1	-0.07	-0.04	-0.36*	1	
12.DoA	6.318	3.293	<b>0.18*</b>	-0.06	-0.03	0.02	-0.06	0.100	-0.04	-0.02	0.08	0.04	-0.11*	1
13.Environment Dynamic	11.70	83.18	<b>0.11*</b>	-0.06	-0.01	-0.04	-0.08	0.38*	-0.04	0.14*	-0.05	-0.01	0.06	0.02

Notes: pooled data; with  $n = 382$ ,  $H_0: \rho_{i,j} = 0$   $H_1: \rho_{i,j} \neq 0$ , \* represents those correlations that are significant at  $p < .05$ ; please find information in Table 5.8. for detailed explanation of each variable; as showed in bold, we can identify the correlation relationships between the cash holding level and predictor variables. The highlighted result demonstrates a significant positive correlation between DoA and the cash holding level.

At this stage, we adopt a univariate approach, quartile analysis, as showed in Table 5.10, which has been widely used by cash holding researchers (Opler et al., 1999), (Ferreira and Vilela, 2004, Garcia-Teruel and Martínez-Solano, 2008). This method helps us to detect whether there are any significant differences in variables studied between the characteristics of the firms and CEOs in relation to their cash holding level. The cash to assets (cash holding level) quartiles are constructed each year, which explains why ranges of the cash-to-assets overlap across quartiles. We examine whether the characteristics of companies and CEOs holding a high cash level (firms in the fourth quartile, Q4th) differ from those with a low cash holding level in the first quartile (Q1st). We carried out a difference in mean value test for observations in quartile 1 and quartile 4 based on Student's t-test to judge if the mean values of the fourth quartile are significantly different from those of the first quartile.

Table 5.10: Characteristics of firms and new CEOs' DoA by cash holding level quartiles

	Q1th	Q2th	Q3th	Q4th	t-value(p)
Min	0	3.210	6.321	12.17	.
Max	6.180	9.544	19.75	83.44	.
Environment Dynamic	-4.206	-0.230	1.031	6.477	
[Median]	-0.619	0.448	2.022	-0.162	0.157
Firm size	8.239	8.923	8.783	7.790	(-)
[Median]	8.345	8.776	8.690	8.015	0.006
Growth trend	8.155	9.402	6.080	11.35	
[Median]	6.575	6.693	4.812	7.580	0.189
Cash flow	7.095	8.737	6.827	5.102	
[Median]	7.887	9.173	8.464	10.36	0.312
Leverage	25.98	24.84	24.93	14.72	(-)
[Median]	25.13	24.18	22.69	6.583	0.000
Quick ratio	0.719	0.935	0.969	1.845	(+)
[Median]	0.697	0.882	0.912	1.233	0.000
Dividend ratio	2.541	4.917	2.859	2.756	
[Median]	1.912	2.385	1.999	1.804	0.561
Capital intensive	208.0	122.7	120.1	237.6	
[Median]	113.4	92.40	80.03	85.99	0.752
Short term to Total debt	26.69	28.59	29.81	48.11	(+)
[Median]	14.29	18	18.98	39.40	0.000
CEO ownership	52.18	53.39	51.43	59.58	(+)
[Median]	47.39	50.32	49.81	61.79	0.022
BoD size	4.284	4.208	3.903	3.575	(-)
[Median]	4	4	4	3	0.000
DoA	5.453	6.167	6.502	7.020	(+)
[Median]	5.335	5.460	5.740	6.880	0.000

**Notes:** Univariate comparison of means and medians of firm characteristics and new CEOs' DoA in cognition reasoning of 893 firm year observations for those FTSE All-Share companies that a new CEO took up his/her post from 2002 to 2007. The number of observations in each quartile (Q1 = 220, Q2 = 224, Q3 = 227, Q4 = 222). From Q1st to Q4th column, the values in the same row with the variable names are the means for each variable in the quartiles; below, the values in the same row with [Median] are the medians of each variable in the quartiles. Ho: mean of Q4 = mean of Q1, H1: mean of Q4 ≠ mean of Q1; the numbers in the last column are the p-values for the Student's t tests. By looking at the quartile comparison between Q4 and Q1 only, (+) represents a positive relationship and (-) represents a negative relationship between the explanatory variables and cash holding level. These relationships have been disclosed in the quartile analysis.

In general, some characteristics of the firms and CEOs holding more cash (in the 4th quartile) are significantly different from those with lower cash holdings (in the 1st quartile). As shown in the table, in a positive way, firms with a higher quick ratio, a bigger short-term proportion of debt, bigger CEO ownership and CEOs who have higher DoA will hold more cash. In contrast, firms which are a larger size, have higher financial leverage and a greater number of BoD memberships will hold less cash. However, other variables such as environment dynamic, firm growth potential, cash flow ratio, dividend ratio, and capital intensity do not show their impact significantly or monotonically on cash holdings as expected in prior literature. This is possibly due to our observations being drawn from the CEO succession context. Also, the joint effects of multiple variables are different from the effect of a single variable individually on cash holding levels. Only comparing the 1st and the 4th quartiles may not be sufficient to disclose the relationships between variables at different levels and cash holding. Hence, we carry on the multivariate analysis below.

#### 5.5.3. Multivariate analysis

To make our findings more robust, we manipulate our regressions for hypothesis testing under various settings and scenarios. Table 5.11 summarizes the results of 8 different models from different settings which allow us to compare them across the columns. The dependent variable Cash1 is explained by different models with all the prior recognized important control variables, using different estimations, with or without the explanatory variable, the DoA of CEOs' cognitive reasoning. The impacts of DoA will be demonstrated via an examination of these different models.

Table 5.11: Firms' cash holding level under different estimations and models

DV:cash1	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Firm size	0.522+ (0.311)	-0.0380 (1.830)	0.518+ (0.312)	-0.594 (1.772)	0.408* (0.204)	-0.668 (1.794)	1.174 (1.661)	1.668 (1.858)
Growth trend	-0.025 (0.024)	-0.017 (0.015)	-0.025 (0.024)	-0.008 (0.015)	-0.010 (0.017)	-0.004 (0.015)	-0.050 (0.031)	-0.020 (0.038)
Cash flow	-0.021 (0.028)	0.019 (0.015)	-0.022 (0.029)	0.014 (0.014)	-0.026 (0.022)	0.010 (0.015)	-0.036 (0.059)	-0.044 (0.059)
Leverage	-0.014 (0.036)	0.110 (0.069)	-0.011 (0.036)	0.088 (0.064)	0.035 (0.024)	0.084 (0.067)	-0.027 (0.096)	-0.005 (0.087)
Quick ratio	7.375** (1.443)	9.158** (1.815)	7.176** (1.420)	8.602** (1.748)	3.510** (0.743)	8.624** (1.695)	2.593+ (1.534)	2.573* (1.040)
Dividend rate	0.008 (0.008)	0.011** (0.004)	0.009 (0.008)	-0.009* (0.004)	0.019** (0.005)	0.010** (0.004)	-0.011 (0.044)	0.029 (0.043)
Capital intensive	- (0.006)	-0.014 (0.016)	- (0.006)	-0.011 (0.015)	-0.009* (0.004)	-0.009 (0.015)	-0.009 (0.020)	-0.003 (0.016)
Short term To total debt	0.089** (0.017)	0.095** (0.022)	0.089** (0.016)	0.097** (0.022)	0.035** (0.012)	0.098** (0.022)	-0.012 (0.040)	0.020 (0.048)
CEO ownership	-0.001 (0.025)	0.037* (0.017)	-0.005 (0.026)	0.039* (0.017)	0.006 (0.014)	0.040* (0.017)	-0.001 (0.078)	-0.005 (0.071)
BoD size	-0.656+ (0.341)	0.0356 (0.299)	-0.580+ (0.340)	0.125 (0.289)	-0.215 (0.229)	0.108 (0.293)	-0.614 (0.773)	-0.737 (0.907)
Environment dynamic	-0.011+ (0.006)	0.009** (0.003)	-0.011+ (0.006)	0.009** (0.003)	-0.006+ (0.003)	0.009** (0.003)	-0.003 (0.005)	-0.001 (0.003)
DoA			0.298* (0.145)	0.260* (0.120)	0.170* (0.096)	0.266* (0.121)		0.595* (0.221)
L.cash1					0.727** (0.045)	0.068+ (0.077)	0.693* (0.099)	0.703* (0.100)
N	384	384	382	382	382	382	384	382
Adj $R^2$	0.328	0.343	0.341	0.367	0.718	0.391		
ar1p							0.001	0.000
ar2p							0.857	0.990
hansen df							43	45
hansenp							0.714	0.765

Notes: Standard errors in parentheses; +  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ ; the intercepts, time dummies have been omitted from the table. ar1p is the p value of AR(1) statistic; hansen\_df is the degrees of freedom for Hansen statistic; hansenp is the p value of Hansen statistic.



In the table above, there are 8 different models which help us to understand the effects of DoA on cash holding. Model (1) is a regression model with only control variables using the OLS estimators. Model (2) is a fixed effects (FE) model with only control variables. Model (3) and Model (4), respectively, are an OLS regression model and an FE model, including the DoA and all the control variables. Models (5) and (6) are an OLS and an FE model with all the control variables, explanatory variable and lagged dependent variable. Models (7) and (8) are dynamic models using the system generalized methods of moment (SGMM) estimators. Model (8) contains all the variables; Model (7) includes all the control variables and the lagged dependent variable but not the DoA. Models (1), (2), (3) and (4) are static models which do not include the lagged dependent variable. Models (5), (6), (7) and (8) are dynamic models which take L.cash1 into consideration. Models (1), (2) and (7) do not include DoA and the remaining models take this into account as the focal predictor for firms' cash holding level. Model (8) is the final model, previously presented in the equation (3).

#### **The System Generalized Methods of Moment (SGMM) models**

The dynamic Models (7) and (8) apply the GMM dynamic estimation which was developed by Arellano and Bover (1995) and Blundell and Bond (1998). Different from the OLS estimation, the SGMM does not require the normality assumptions and allows a certain degree of heteroskedasticity in the data. The robust Hansen J-tests were applied in the two-step estimation process. Based on the available data, we have 382 observations in the final model. The small sample raises the downward bias of estimated asymptotic standard errors in the two-step procedure (Baltagi, 2008). We select the "Windmeijer correction" (Windmeijer, 2005) using the STATA "small" option to report the corrected results.

The autocorrelation of disturbance terms shows whether or not the applied instruments in the model are exogenous. Our results demonstrate the appropriateness of these autocorrelation assumptions. There is only first order serial autocorrelation and no stage 2 serial autocorrelation of residuals ( $ar2p$  is 0.857 in model (7) and  $ar2p$  is 0.990 in model (8)).

The Hansen J-statistical tests (Baum, 2006) examine the correctness of model specification and valid over-identifying restrictions; i.e. all instruments are exogenous. The reported p value is 0.714 for the base Model (7) and has been increased to 0.765 for the final Model (8). This provides some evidence that including our focal constructs can improve the quality of our model. To test the validity of the subsets of instruments (i.e. levels, differenced and standard IV), `xtabond2` provides a difference-in Sargan/Hansen test, also known as the C-test (Baum, 2006). This test compares the system GMM with and without a subset of suspect instruments; the validity (exogeneity) of any subset of instruments and their contributions toward the increase in J-statistics (Roodman, 2009a). All the p-values of these statistical tests have been increased from the Model (7) to the final Model (8), which gives us confidence about the additional explanatory power of our explanatory variable, DoA.

For both models, (7) and (8), to cope with the problem of instrument proliferation (Roodman, 2006), we use the “collapse” option of `xtabond2` which creates one instrument for each variable and lag distance, rather than one for each time period, variable and lag distance. It effectively constrains all the yearly moment conditions as the same (Wintoki et al., 2012).

Both estimated coefficients of the lagged dependent variable in Model (7) and Model (8) are less than one absolute unity (Roodman, 2009b), which indicate the “steady

state” of our model assumption. Further evidence of the validity of our dynamic panel models is the comparison among the estimated coefficients of the lagged dependent variables (Bond, 2002). For L.Cash1, OLS estimated coefficient 0.727 in Model (5) is bigger than GMM estimated coefficient 0.703 in Model (8), and GMM estimated coefficient is bigger than FE estimated coefficient 0.068 in Model (6). These results demonstrate the validity of the final GMM Model (8) according to Bond’s criteria.

The F-tests for joint significances both ( $p=0.000$  in both Model (7) and (8)) reject that the explanatory variables are jointly equal to zero; this result also provides support for the validity/appropriateness of both models.

### **The interpretation and comparison across models**

Our focal explanatory variable, the DoA of CEOs’ cognitive reasoning, demonstrates its effects on cash holding levels toward the same direction consistently and significantly across all the models, no matter whether the static Models (3) and (4) or in the dynamic Models (5) (6) and (8). These results fit with the predicted relationship in the hypothesis development section: there is a positive relationship between DoA and cash holding; an increased DoA score will lead to the increase in cash holding. The coefficients of DoA range from .170 to .595; the results of significant coefficient tests are at  $p < .05$  level and in the final model, it is at  $p < .01$  level. Therefore, the hypothesized relationships are supported throughout.

The results demonstrated two interesting facts: while using the same estimation methods, *ceteris-paribus*, dynamic models with the lagged dependent variable as a predictor have better explanation powers than those static models. As shown, we can compare Model (3) with Model (5), and Model (4) with Model (6) by adding the lagged dependent variable,  $R^2$  increases from .341 to .718 and from .367 to .391, respectively.

*Ceteris-paribus*, adding DoA into the models will increase the explanatory powers and the fitness of model as well. For the second fact, by comparing Model (1) with (3) and Model (2) with (4),  $R^2$  has increased from .328 to .341 and from .343 to .367, respectively. This evidence unveils the importance of including DoA to explain the dependent variable even in the static models. Also, when comparing Model (7) and (8), the p-value of the Hansen-J test of over-identifying restrictions has increased from .714 to .765, which illustrates a better model.

Across our models, the expected importance and significance of two control variables did not appear across all of them, i.e. the growth tendency of the firms, the cash flow ratio. This might be due to the CEO succession context, under a dynamic environment. The influences of the growth potential and cash flow ratio have complicated implications for the firms. It contradicts prior studies and needs to be further investigated under a similar context. One of the most important explanatory variables in our models is the quick ratio which is important across all eight models. The financial health of a firm plays a crucial role here. The relationship of quick ratio and cash holding is positive. Generally speaking, firms' financial status influences the cash holding level as we can see from the magnitude and significance of coefficients of quick ratio across different models. This implies that the financially unconstrained firms have more capability to retain cash on hand. Dividend ratios have a small and negative but significant impact on cash holding levels in Models (2), (4), (5) and (6). Capital intensity has a small negative but significant impact on cash holding levels in Models (1), (3) and (5). Reducing dividend payout can help firms increase their cash on hand, and capital intensity might burn out firms' cash on hand. The negative influences of board size on cash holding only appear significant in static Models (1) and (3). CEO ownerships have positive significant relationships on cash

holding in Models (2), (4) and (6). These corporate governance factors lose the significance of their impacts on cash holding while using advanced dynamic methods. Environment dynamic, measured as the industry growth trend, has negative but small significant effects on cash holding level. Short-term to total debt ratio has positive and significant effects on the cash holding level. However, their importance disappears in the dynamic models using the system GMM estimations.

We have also conducted three types of robustness check: 1) while selecting instrumental variables for the final dynamic SGMM Model (8), the explanatory variable, DoA and other control variables have been set as predetermined variables; 2) using alternative measurements for variables such as cash holding level, firm size, quick ratio and CEO ownership etcetera in all eight models; 3) taking out those explanatory variables with insignificant regression coefficient ( $\beta$ ) test results, i.e. growth trend, cash flow ratio and leverage and then rerun the 8 models. The above results remain similar; the significant and positive relationships between DoA and cash holding level have been confirmed under different settings. For the scope of this paper, we do not report the detail of robustness tests here.

To sum up the discussion, the hypothesis is supported by the evidence above across different models. A high DoA of CEOs' cognitive reasoning will increase firms' cash holding level. A low DoA in the cognitive continuum will decrease firms' cash holding level.

## 5.6. Discussions and conclusions

Building on the CCT, this study intends to provide additional explanations on top of current theories in cash holding because the extant ones are mainly based on rational economic assumptions, unlike the traditional upper echelon theory and bounded rationality

which mainly adopt demographic proxies. We examined the subjective importance of CEOs by borrowing a novel psycholinguistic approach to measure the DoA in CEOs' cognitive continuum directly. This extends the recent developing stream of behavior finance that departs from rational economic reasoning (Subrahmanyam, 2008). We advocate that CEOs' cognitive reasoning offers a new tradeoff angle for cash holding researchers.

I integrate the analytic-intuitive cognition spectrum by taking into account the DoA, as a construct for bringing behavioral science into traditional cash holding models. Using a partial adjustment dynamic approach in a longitudinal dataset, this study suggests that the DoA may increase the estimated transactional costs of raising funds, enhance uncertainty avoidance activities, diminish fast-moving competitive advantages, and increase the related opportunity costs. It makes the CEOs more precautionary and more risk adverse. Consequently, it raises the cash holding levels.

This study also has practical implications for shareholders and investors in the market. It provides an opportunity for them to appreciate the cognitive reasoning that CEOs invoke. It encourages CEOs to adopt different DoA to carry out reasoning and information processing. Bringing down the firms' cash holding levels by suggesting that CEOs adopt a low DoA will be a novel and useful attempt. Furthermore, intuition, with a low DoA, can be acquired in the course of education (Sadler-Smith and Shefy, 2007). It thus provides educators and policy-makers a new avenue to explore to find solutions to the cash holding problems.

I believe this study to be the first to attempt to adopt the psycholinguistic approach and focus on the DoA in CEOs' cognitive continuum to study cash holding policies. The findings demonstrate the importance of DoA and the evidence of our claims under

different estimations and with alternative measurements is very robust. This study could be an important complement to the current economic theories of cash holding; new CEOs' cognitive reasoning offers additional explanations to cash holding levels in a leadership succession context. The psychology of CEOs plays a vital role for firms' strategies and policies. The DoA can be further examined in studying other financial strategies in future studies.

## **Chapter 6: Concluding remarks and reflections**

This thesis sought to join the conversation on top executive research by adding on those widely neglected “hot & soft” psychological elements of CEOs. In a CEO succession context, this thesis asked “why” (antecedences) and “so what” (consequences) questions. To pursue the answers, the research comprised three independent empirical studies on 1) CEO turnover types, 2) PSSC, and 3) cash holding policy, with CEOs’ psychological factors such as cognition and emotion being the main themes throughout. Succession events in the FTSE All-Share Index were picked according to some selection criteria in a six-year timeframe from 2002 to 2007. Other useful data such as company news and annual reports were collected surrounding these events. To understand the related organizational phenomenon in a CEO transition better, I investigated its antecedences and consequences by taking advantage of the psycholinguistic approach and content analysis techniques. These methods enabled us to explore some areas not yet penetrated in the existing literature.

In the previous chapters, the majority of the hypotheses developed by each essay were supported but not all the prior recognized relationships were congruent with previous studies. Empirical results produced both expected and unexpected outcomes which are worthwhile thinking about here.

This final chapter first highlights and draws a comparison with the main findings of this research. Second, it summarizes the novelties of the presented studies, the contributions to the research fields. Then, it moves on to discuss the practical implications for policymakers and managers, the limitations of this research. Last but not least, it provides some reflections on this study. Figure 6.2 illustrates the main points of this final chapter as below:



Figure 6.2: A reflection on three empirical studies

	Essay 1: Turnover types	Essay 2: PSSC	Essay 3: Cash holding
Main actual findings	FFA increases the likelihood of CEO voluntary turnover; NE boosts the likelihood of involuntary turnover.	Internal factors, i.e. FFA and C2C increase the degrees of PSSC variation; and NE decreases it.	DoA will increase firms' cash holding level.
Novelties	Consider the proactive roles of the old CEOs; Reinforce old CEOs' wills according to the voluntary/involuntary turnover type definition; Emphasize not only cognition, i.e. FFA but also emotion, i.e. NE of the old CEOs. . . .	Use PSSC variation measure; Look at intra-individual differences rather than compare the differences between predecessors and successors; Developed a C2C measure; Control unobserved heterogeneity by tracing the same new CEOs longitudinally in the fixed effects panel data analysis.	Measuring DoA by using DICTION 5.0 pre-defined dictionary; Robustly test the effects of independent variables in both dynamic and static models under different scenarios.
Contributions (to the conversation)	Take account of career development aspects; Apply a dual channel analysis into leadership turnover research; Significantly increase the explanatory power compared with previous studies. . .	Potential mediation roles of new CEOs' psychology between firms' performance and PSSC; An integrated view of the trilogy of new CEOs' psychology; Better explanatory power than looking at each of psychological factors solely.	One of the first studies on cash holding under the CEO succession context; Considering CEOs' cognitive approaches in behavior finance studies; Complement to current "hard and cold" rationale economic theories; Better explanatory powers
Practical implications	BoDs should evaluate old CEOs' FFA and NE; Old CEOs should appropriately manage their NE.	CEOs have to be self-aware of their psychological factors; Governance body should pay attention to new CEOs' psychological states.	Appreciate CEOs' cognitive approaches, i.e. DoA and its importance in decision-making.
Limitations	Generalizability; sample sizes; non-succession cases; variance models.	Small T; quality of measurements.	Small T; quality of measurements.
Future studies	Collect more CEO letters to study those non-succession cases. . .	Using smaller lens of time scale; Other geographic territories; Potential mediation roles of CEO's psychology.	Other financial phenomena, e.g. capital structure, investment strategies etc.
Reflections	Psychological factors of CEOs do matter; Extension to other subjects in management studies		

6.1. Main findings and comparisons

The three essays are independent of each other; they are different in the objects of study, dependent variables, theoretical frameworks, analytic methods and so on. However, they are interlinked with each other as in a drama series.

Essay one found that the likelihood of the CEO involuntary turnover against the voluntary departure is influenced by old CEOs' FFA and NE. FFA increases the likelihood of CEO voluntary turnover; NE boosts the likelihood of CEO involuntary step-down.

Essay two discusses both the internal and external causes of PSSC. It discovers that internal psychological factors, for example, both FFA and C2C of new CEOs, will increase the degrees of PSSC variation; and their NE will decrease it.

The third essay explores the relationships between new CEOs' cognitive approaches and the partial adjustment outcomes of cash holding level. This research provides empirical evidence that DoA is important for new CEOs to determine the cash holding level for their firms. DoA is another mechanism impacting the transaction cost and opportunity cost calculation. The high DoA will increase a firm's cash holding level and a low DoA will decrease it.

Although the object of study in essay one is the old CEOs and the study objects in essays two and three are the new CEOs, we can perceive that no matter whether predecessors or successors, CEOs' psychological factors are very important for their decisions not only for the companies and but also for themselves. Leaders' psychological factors do matter in the CEO transition period; the empirical results show that they can increase the explanatory power of our models and may absorb the effects of other important variables as recognized in prior literature [for example, performance variables in essays 1 and 2, making them less significant (a potential mediation effect) after taking account of the focal independent variables]. Other interesting phenomena such as CEOs' power and organizational inertia have also been discovered in the results. While comparing the insights from essays one and two, I identify some general favorable effects

of FFA and general adverse influences of NE towards the results for executives' career management and for the firms' strategic activities.

## 6.2. Novelties and contributions

This research adopted some novel approaches and perspectives to understand the CEO succession and other relevant organizational phenomena better. The main contribution is the illumination of the importance of leaders' psychological factors in strategic management. The subjective constructs were measured directly using content analysis techniques rather than using demographic proxies.

### 6.2.1. Novelties

According to its definition, whether an old CEO's turnover is involuntary or voluntary depends on his/her own will. However, incumbents' wills have been broadly ignored in the existing literature. Essay one started by considering the proactive roles of incumbents. It reinforced the importance of the incumbents' role in the selection of succession types. The research not only emphasized the incumbents' cognition element, i.e. FFA, but also emphasized the emotional factor, i.e. NE.

Different from previous studies which mainly concentrate on comparing the differences between predecessors and successors, the second essay looked at intra-individual (time-varying) differences. It applied variation measures for PSSC. Additionally, it developed a novel measurement to gauge C2C; it controlled unobserved heterogeneity by tracing the same new CEOs longitudinally in the panel data analysis.

Essay three appreciated DoA as an important indicator and bridging construct in behavior science; it demonstrates the influences of new CEOs' cognitive approaches in the

way they employed for cash holding decisions. The research tested the effects of independent variable in both static and dynamic models under different scenarios.

#### 6.2.2. Contributions

The first essay contributed to CEO succession literature by first taking account of the executive career management perspective. It applied a dual analysis covering both cognitive and emotional elements. Empirical results showed that the research has significantly increased the explanatory power compared with previous studies.

Essay two takes an integrated and holistic view to illuminate the importance of the psychological trilogy of new CEOs for PSSC. Methodologically, it produced an example tracing the same objects of study longitudinally. An integrated perspective can achieve better explanations for the PSSC than using each of single factor solely.

The third essay will be one of the early studies on cash holding in a CEO succession context. It contributed to behavioral finance research by considering the DoA in CEOs' cognitive approaches of the judgment process. It complemented current "hard and cold" rationale economic theories and provided a better explanation for the cash holding strategy.

#### 6.3. Limitations and future studies

Each essay identifies its shortcomings and future research direction in each chapter, respectively. There are some general limitations originating from the coding method for raw data analysis, for example, the appropriateness of using CEOs' shareholder letters to distill the independent variables, CEOs' psychological factors; some focal construct measurements rely on predefined dictionaries built in the computer-aided content analysis software. All the data used in this thesis are generated from archival sources rather than

primary data from direct observations. Therefore, some of the responsibilities of validity and reliability issues rely on other people's hands.

Yet, I think of the unobtrusive method as an advantage rather than a drawback because it helps us to avoid the psychological reactions that other inquiry methods might cause. All these issues need to be further justified to increase the generalizability of our findings. These studies will also face some challenges inherited from a variance model approach. Other limitations that raise our concerns include relatively small sample sizes and small T (times of observation) due to the data availability problems.

Essay one can be extended if we have the time and resources to collect more shareholder letters from those non-succession cases and a multinomial logit model could be applied in that setting. However, this would tremendously increase the workload of this research study.

Following essay two, more studies, for example by using different intervals of time scale (quarter, month), extending the research to other geographic territories, exploring the potential mediation roles of psychological factors can further develop the research into the next stage. Other than using the resource allocation profile as a proxy to calculate strategic changes, we can extend the second essay by using other change indicators, for example, using market scope, operation scope, service/product quality, cost efficiency and so on, recommended by Cho and Hambrick (2006). We can examine another dimension of strategic changes, *speed* reflecting how quickly the strategic change take place. Strategic change speed brings the firm early competitive advantages and organizations need to change rapidly to cope with the immediate and drastic challenges from the environment ; (Forbes, 2005).

Similar approaches and the ideas from essay three can also be applied to investigate other financial phenomena such as capital structure, investment strategies and so on.

Since the raw data of CEO shareholder letters and company news are generic data sources, they can be reused (data mining) for other research topics and other interesting constructs such as market orientation, entrepreneurial orientation, external corporate governance mechanism and so on. Furthermore, it will be interesting if the research approaches, focal constructs, concepts of this thesis, are applied to other management studies. Considering the complexity of psychological factors and processes, the cross levels effects underlying the observed phenomena, our abstract knowledge and simplified

of research on similar themes. Surveys, qualitative interviews, case studies, ethnography, action research and so on might deepen our understanding in these topics.

However, I am aware of the difficulties to get access to the organizations and CEOs. It would be better if I have an internship opportunity in the executive consultant firms. Street smarts give researchers more insightful knowledge and information about their studies.

6.4. Practical implications and reflections

6.4.1. Practical implications

This thesis can offer practitioners, for example, investors, BoDs, stakeholders, fund providers, employees, general public, policy makers, CEOs themselves and so on some interesting materials and can bring some thoughts to them. It can offer a comprehensive, simplified, abstract framework which assists us in our understanding of

why and how CEOs' make certain decisions and firms act in certain ways responding to the external environments. Despite their complexity and abstraction, I believe that cognition, emotion and conation can be potent constructs helping us to understand managers' decisions and organizational behaviors better. Rather than giving practitioners a precise instrument to gauge those important psychological issues, this research merely intends to raise peoples' awareness in a modest way and concerns those subtle but significant effects of executives' psychology.

Incorrectly interpreting these psychological signals can lead to some disaster consequences and misleading results. People should evaluate CEOs' emotions and cognition, which reveal much useful information and many hints. For example, by figuring out CEOs' emotions, subordinates might able to judge whether their leaders really want to make the moves for the strategic changes or not. For those people such as executive career development consultants, coaches and head hunters who are providing comments and advice for top managers, this study gives them an example using unobtrusive methods to collect and analyze information. The Chairman, BoDs, and other stakeholders can look at the psychological states of CEOs to appreciate the potential implications for their firms.

For the top executives themselves, they should learn how to express, control and manage their emotions better; they should foster their emotional intelligence and their capability in this area. Also, they need to develop mutual understanding via the communication between CEOs and stakeholders. Evaluating the cognitive approaches adopted by CEOs offers us much interesting and useful information. Because of the general favorable outcomes of FFA and general adverse implications of NE, CEOs should

develop their skills to boost these positive elements in their mental functions and suppress those negative ones.

Popular interest in CEO succession and top executive studies demonstrate a prevailing trend. However, little has been put into practice so far by considering the emotion, cognition and conation elements of CEOs together. This study brings in some fresh air for practitioners who normally pay attention to this concrete information such as CEOs' gender, education, qualification, skills, and so on. More practice should be encouraged to look at the emotion of the managers.

I experienced some difficulties in collecting data for this study because in the UK, we do not have those aggregated databases which are popular and widely used in the USA. Information about the companies, the governance structure, and the CEOs are scattered around and this study has consumed much time, money, and manpower on collecting and processing the raw data. It would be better if the regulations in the UK required listed companies to report more discourse and text information to the public compulsorily. It would be very helpful if the industries were willing to make this information available to researchers more easily and with less cost, particularly for doctoral students.

#### 6.4.2. Some reflections

As discussed in the prior sections, the importance of those "hot & soft" factors has been widely ignored in the management research. I acknowledge the instability and dynamic nature of human psychology. It is difficult to gauge the effects of CEOs' psychology across the levels from individuals to organizations (Bacharach, 1989). The influences from CEOs' minds to the organizational outcomes seem to be "a bit far away". I have faced criticism and challenges from other colleagues who have difficulties in believing the effects of CEOs' psychological factors on organizational activities.



However, there is much evidence supporting the suitability of our methodology. While studying relationships across boundaries of time, organizations and levels of analysis (Bacharach, 1989), content analysis is an appropriate approach to bridge the micro-macro gap and enhances the potential of theorizing (Sonpar and Golden-Biddle, 2008). In studying the psychology of CEOs by using the content analysis of their letter to shareholders (Sonpar and Golden-Biddle, 2008), the problems of cross level effects can be alleviated in developing adolescent theories for organizations.

I am fully aware of the preliminary and exploratory nature of this research. Hence, this thesis is more concerned about its explanatory power than its predictive power. Economic factors and human factors are congruent and complement each other. Researchers studying top executives' psychological factors should be rather humble about their findings and acknowledge the less deterministic effects of psychological factors in explaining organizational phenomena.

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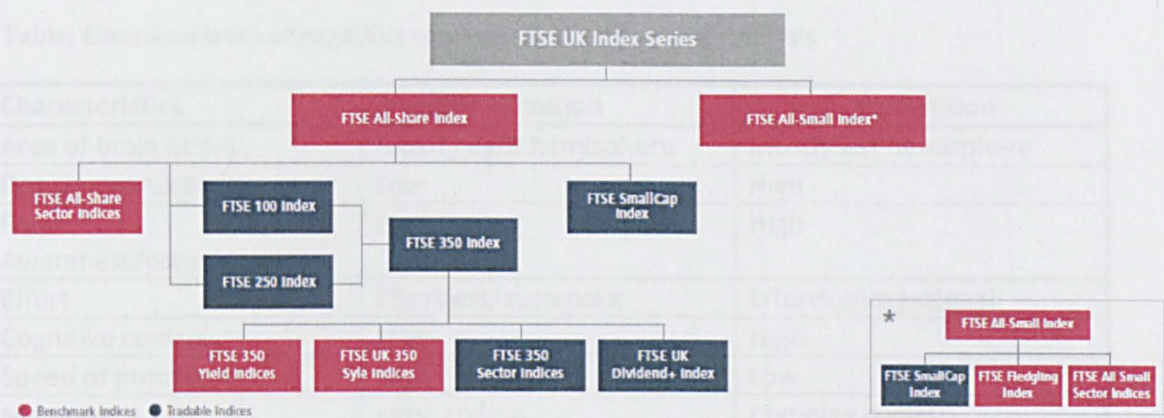
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APPENDICES

Appendix 1: The FTSE index family tree



Sources: FTSE All-Share Index Factsheet,  
[https://www.ftse.com/Indices/UK\\_Indices/Downloads/FTSE All-Share Index Factsheet.pdf](https://www.ftse.com/Indices/UK_Indices/Downloads/FTSE_All-Share_Index_Factsheet.pdf)  
[accessed on 01/06/2012]

Appendix 2: The properties of intuitive and analytic cognition

The table below demonstrates the properties associated with intuition and analysis, as two extreme poles in the cognitive continuum.

**Table: Characteristics of cognitive continuum: Intuition and Analysis**

Characteristics	Intuitive cognition	Analytical cognition
Area of brain activity	Mostly right hemisphere	Mostly left hemisphere
Decision consistency	Low	High
Procedure Awareness/conscious	Low	High
Effort	Effortless/automatic	Effortful/intentional
Cognitive control	Low	High
Speed of processing	High	Low
Memory	Little coding	Complex coding
Metaphors used	Pictorial, qualitative	Verbal, quantitative
Information used	Flexible	Consistent
Confidences in judgments	Low	High
Errors in judgment	Normally distributed	Non-normally distributed

Notes: Developed from (Dunwoody et al., 2000), (Doherty and Kurz, 1996) and (Dhmi and Thomson, 2013)

Intuition cognition normally take places in the right hemisphere of the human brain. In an intuitive cognition mode, the individuals’ cognitive control is low and the information processing is effortless. The consistency and reliability of the information processing results are low. Individuals have low awareness of their cognitive activities; however, the speed of their cognitive activities is high. Memory has little encoding. The metaphors used in this mode are vivid pictorial and qualitative. Information used is flexible, confidence in judgment is low, and the error of judgment is normally distributed.

In contrast, analytic cognition mostly happens in the left hemisphere of the human brain. Under an analytic cognition mode, individuals have strong control over the process and they put much effort into it. The results of information processing have high consistency and reliability. It is high in awareness of cognitive activity. The cognitive activity is at low speed. It demands complex coding and it prefers to use verbal and numerical data. The information used is consistent; the confidence of the judgment is high. The error in judgment is non-normally distributed.

Appendix 3: The importance of lagged dependent variable

If we ignore individual characteristics, only using lagged dependent variable as predictor in the equation, we have the following results for the first different GMM estimation (a), the system GMM estimation (b), the OLS regression (c) and fixed effects (FE) model (d). The table below is a simplified illustration of the importance of lagged dependent variable. The lagged dependent variable plays a key role influencing the cash holding level since all the coefficient tests are highly significant. The OLS model (3) is able to receive a very high  $R^2 = 0.696$ . As expected, according to the Bond (2002) dynamic model validation criteria, the coefficients of lagged dependent variable in GMM estimated dynamic models are between the value of estimated coefficients in OLS and FE models. System GMM estimation is better than first different GMM because the p value of Hansen test of over-identifying restrictions has been increased from 0.691 to 0.796.

**Table: The importance of lagged dependent variable in dynamic models**

Cash1	(a)	(b)	(c)	(d)
L.cash1	0.715** (0.119)	0.639** (0.0708)	0.807** (0.0308)	0.218** (0.0641)
dum year3	-8.902+ (4.868)	-7.783+ (4.363)	.	.
dum year4	-6.125 (4.777)	-5.354 (4.270)	-2.379 (3.235)	2.759 (1.967)
dum year5	-4.499 (4.850)	-3.832 (4.335)	-1.582 (3.198)	1.721 (1.659)
dum year6	-5.022 (4.779)	-4.329 (4.247)	-2.275 (3.070)	1.486 (1.189)
dum year7	-5.603 (4.817)	-4.734 (4.241)	-2.896 (3.010)	1.278 (0.960)
dum year8	-7.044 (4.774)	-5.877 (4.211)	-3.600 (3.008)	0.235 (1.001)
dum year9	-7.417 (4.768)	-6.322 (4.158)	-4.124 (3.008)	-0.723 (0.753)
dum year10	-6.249 (4.699)	-5.450 (4.075)	-3.386 (2.986)	-0.611 (0.677)
dum year11	-6.316 (4.742)	-5.468 (4.048)	-3.366 (3.007)	-0.692 (0.646)
dum year12	-7.161 (4.877)	-5.894 (4.082)	-3.517 (3.032)	-0.501 (0.872)
dum year13	-7.299 (5.183)	-5.710 (4.467)	-3.490 (3.286)	-0.0489 (1.015)
cons	.	9.452* (4.131)	5.375+ (2.963)	8.938** (0.815)
N	889	891	891	891
Adj $R^2$	.	.	0.696	0.0581
ar1p	0.000	0.000	.	.
ar2p	0.181	0.199	.	.
hansen df	19	24	.	.
hansenp	0.691	0.796	.	.
Standard errors in parentheses, +p<0.1,*p<0.05,**p<0.01				